



F5 101 - Application Delivery Fundamentals

v3 TMOS v13.1

CERTIFICATION PREP

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May 2020

F5 Certification Exams



Solutions Expert

Security Solutions **401**

Cloud Solutions **402**

Future Enterprise

Future Exams



Technology Specialist

LTM Specialist (b) **301b**

LTM Specialist (a) **301a**

DNS Specialist **302**

ASM Specialist **303**

APM Specialist **304**

Future Exams



Administrator

TMOS Administration **201**

Future Exams

Pre-Sales Fundamentals **202**

Application Delivery Fundamentals **101**



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F5 101 Application Delivery Fundamentals

Exam 101 Blueprint



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101 - Application Delivery Fundamental EXAM BLUEPRINT

ABOUT THE 101-APPLICATION DELIVERY FUNDAMENTALS EXAM.

The 101-Application Delivery Fundamentals exam is the first exam required to achieve Certified F5 BIG-IP Administrator status.

Successful completion of the 101-Application Delivery Fundamentals exam acknowledges the skills and understanding necessary for day-to-day management of Application Delivery Networks (ADNs).

WHAT IS THE 101-APPLICATION DELIVERY FUNDAMENTALS EXAM BLUEPRINT?

F5 Certified! exam blueprints list all the objectives an exam has to measure, much like a syllabus for the exam itself. Blueprints provide a detailed breakdown of the skills and knowledge a candidate should have to pass the exam. Blueprints can be used to identify areas for additional study, and are best used in conjunction with the Exam Study Guides.

PREREQUISITES:

None

CREDENTIAL AWARDED:

None (prerequisite to the TMOS Administration exam)

THIS EXAM IS BASED ON V13.1



Exam Structure

F5 101 EXAM - APPLICATION DELIVERY FUNDAMENTALS

TMOS 13.1

Multiple Choice (there are NO True/False questions!)

Not Adaptive

80 questions in 90 mins

No command line engines

View whole exhibit before you close them

Manage Your Time!

You can flag, review and re-answer questions (within the 90-minute test limit!)

*Secure Sauce (exam tips) at the end of the presentation!


F5 Exams: Multiple Attempt Rules!

- After first failure, you must wait 15 days to re-test
- After second failure, you must wait 30 days to re-test
- After third failure, you must wait 45 days to re-test
- After fourth failure, you must wait 1 calendar year to re-test

F5 Candidate Registration

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Additional Certification Resources

- **Practice Exams through ZooMorphix at www.examstudio.com**

You will be able to setup account through Cert Program Enrollment Process
(see next slide for list of exams)

- **Online exam study guides found here:**

<https://clouddocs.f5.com/training/community/f5cert/html/>

(NOTE: supporting K-Doc for each objective is listed – very helpful!)

- **LinkedIn**

F5 Certified Professionals

LinkedIn – F5 Certified! – 101

LinkedIn – F5 Certified! – 201

<https://www.linkedin.com/groups/85832>

<https://www.linkedin.com/groups/6711359/profile>

<https://www.linkedin.com/groups/6709915/profile>

Available F5 practice exams



Logged in as: F50000092128

Candidate Name: Mickey Woods

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Practice Exam Store




Select an exam to purchase and agree to the terms and conditions. Click "Checkout Now" button to purchase the selected exam.

<input type="checkbox"/> Exam Name	Description	Price
<input type="checkbox"/> 101 Application Delivery Fundamentals Practice x1	1 attempt within 30 days of purchase, USD	25.00
<input type="checkbox"/> 101 Application Delivery Fundamentals Practice x2	2 attempts within 90 days of purchase, USD	40.00
<input type="checkbox"/> 201 TMOS Administration Practice x1	1 attempt within 30 days of purchase, USD	25.00
<input type="checkbox"/> 201 TMOS Administration Practice x2	2 attempts within 90 days of purchase, USD	40.00
<input type="checkbox"/> 202 Pre-Sales Fundamentals Practice x1	1 attempt within 30 days of purchase, USD	25.00
<input type="checkbox"/> 202 Pre-Sales Fundamentals Practice x2	2 attempts within 90 days of purchase, USD	40.00
<input type="checkbox"/> 301a BIG-IP LTM Specialist: Architect Setup and Deploy Practice x1	1 attempt within 30 days of purchase, USD	25.00
<input type="checkbox"/> 301a BIG-IP LTM Specialist: Architect Setup and Deploy Practice x2	2 attempts within 90 days of purchase, USD	40.00
<input type="checkbox"/> 301b BIG-IP LTM Specialist: Maintain and Troubleshoot Practice x 1	1 attempt within 30 days of purchase, USD	25.00
<input type="checkbox"/> 301b BIG-IP LTM Specialist: Maintain and Troubleshoot Practice x 2	2 attempts within 90 days of purchase, USD	40.00
<input type="checkbox"/> 302 BIG-IP DNS Specialist Practice x1	1 attempt within 30 days of purchase, USD	25.00
<input type="checkbox"/> 302 BIG-IP DNS Specialist Practice x2	2 attempts within 90 days of purchase, USD	40.00
<input type="checkbox"/> 303 BIG-IP ASM Specialist Practice x1	1 attempts within 30 days of purchase, USD	25.00
<input type="checkbox"/> 303 BIG-IP ASM Specialist Practice x2	2 attempts within 90 days of purchase, USD	40.00
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GETTING STARTED SERIES



Getting started



HomeConnectLearning

CURRICULUM

Getting Started with Local Traffic Manager (LTM)

Last Updated 02/28/2020 Duration 50 minutes

Details

This curriculum includes the two Getting Started with BIG-IP LTM courses. The topics presented are organized around a customer scenario that takes an organization's globally expanding e-commerce site from a single server to multiple load balanced back end servers behind a pair of BIG-IP LTM systems.

You'll learn how to implement the high availability feature to establish an active/standby device service cluster. You'll learn how to load balance web application traffic across a pool of non-homogenous servers. You'll learn how to use an iRule to customize traffic flow, selecting the appropriate pool of back end servers based on the client's preferred content language. And finally, you'll learn how to decrease existing server load reducing concurrent connections and connection rates using OneConnect.

CURRICULUM

Getting Started with Local Traffic Manager (LTM)

In Progress

Open Curriculum

vLab Environment

- You will need basic exposure to the F5 TMOS GUI
- Because you are an F5 partner you can download our vLab Environment
<https://downloads.f5.com/>
- You will need to download necessary vLab content as well as BIG-IP VE
- You can run this in ESXi or anywhere you can run VMWare WS or Fusion.
- Follow instructions in the vLab documentation to build out environment.

This class/presentation content:

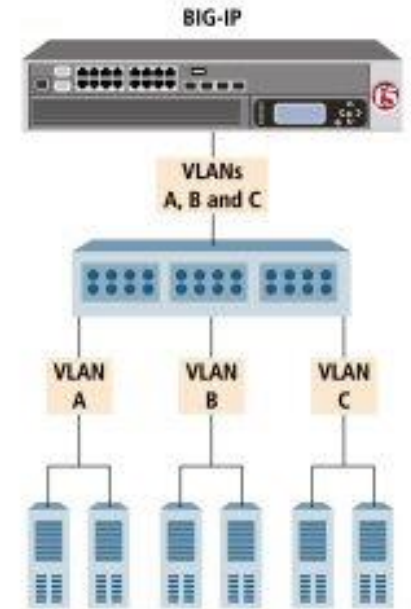
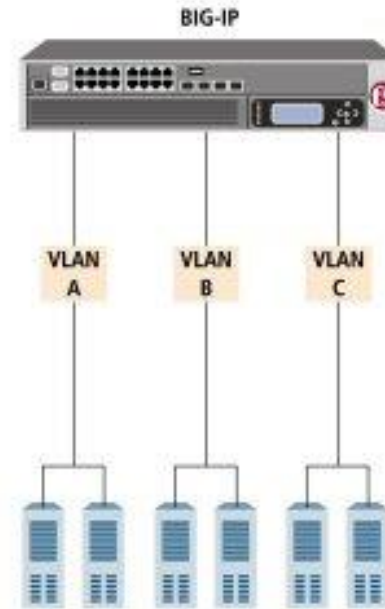
<https://clouddocs.f5.com/training/community/f5cert/html/class1/class1.html>

Section 1: Configuration

Objective 1.01

GIVEN A SET OF REQUIREMENTS, CONFIGURE VLANS

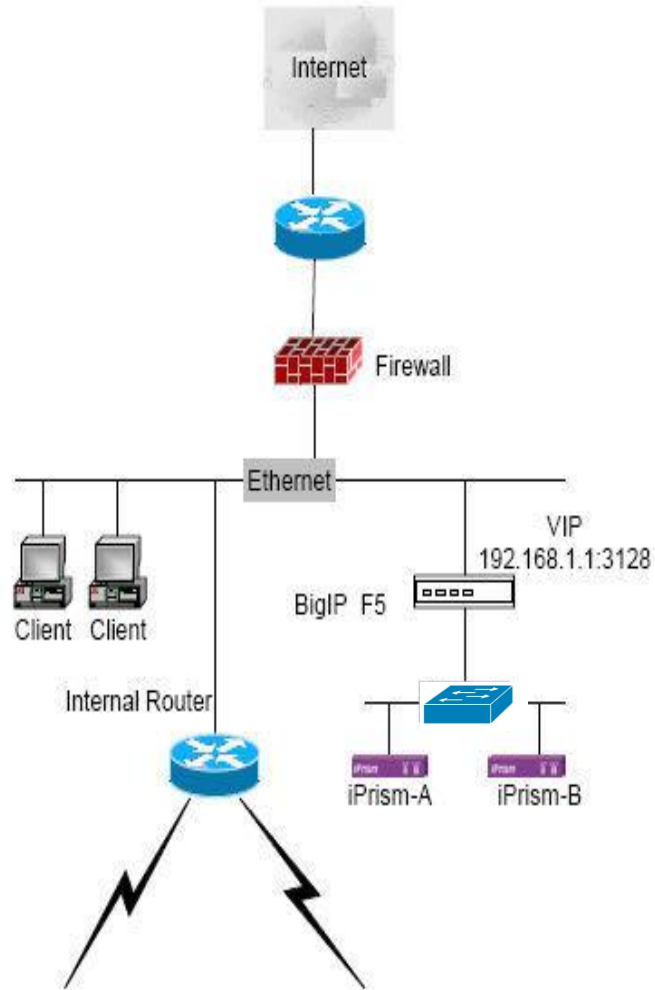
- Assign a numeric tag to the VLAN if required
- Determine appropriate layer 3 addressing for VLAN
- Specify if VLAN is “tagged or untagged”



https://techdocs.f5.com/kb/en-us/products/big-ip_ltm/manuals/product/tmos-routing-administration-13-1-0/5.html

Objective 1.02:

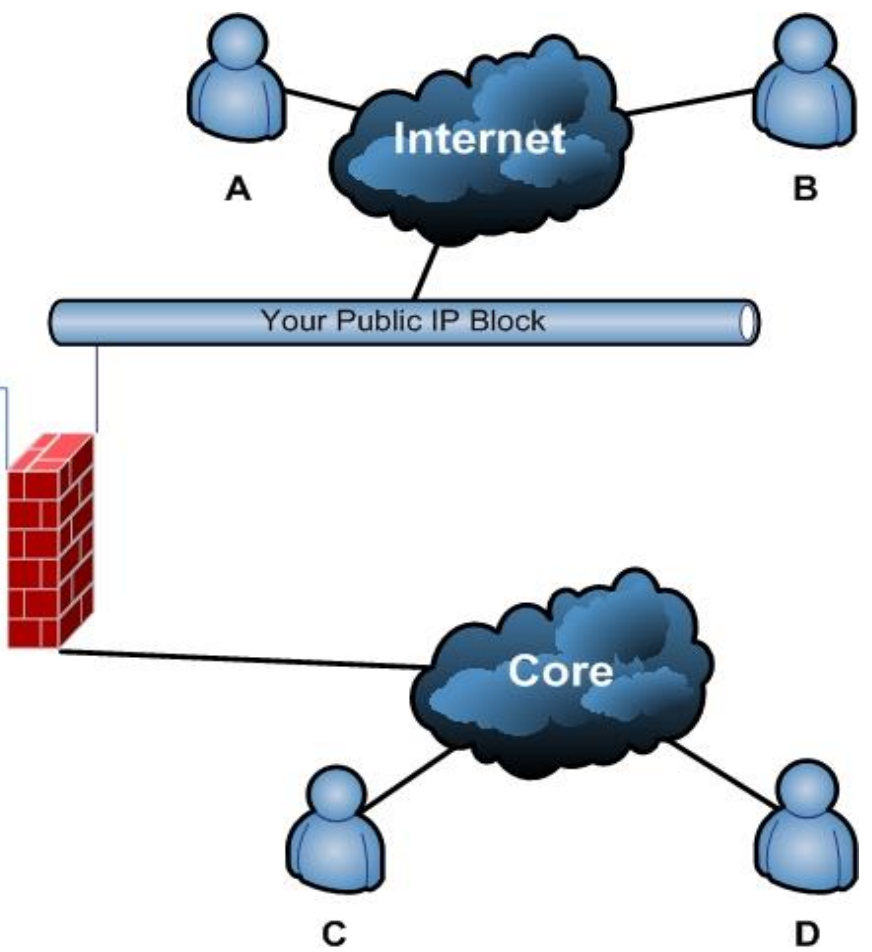
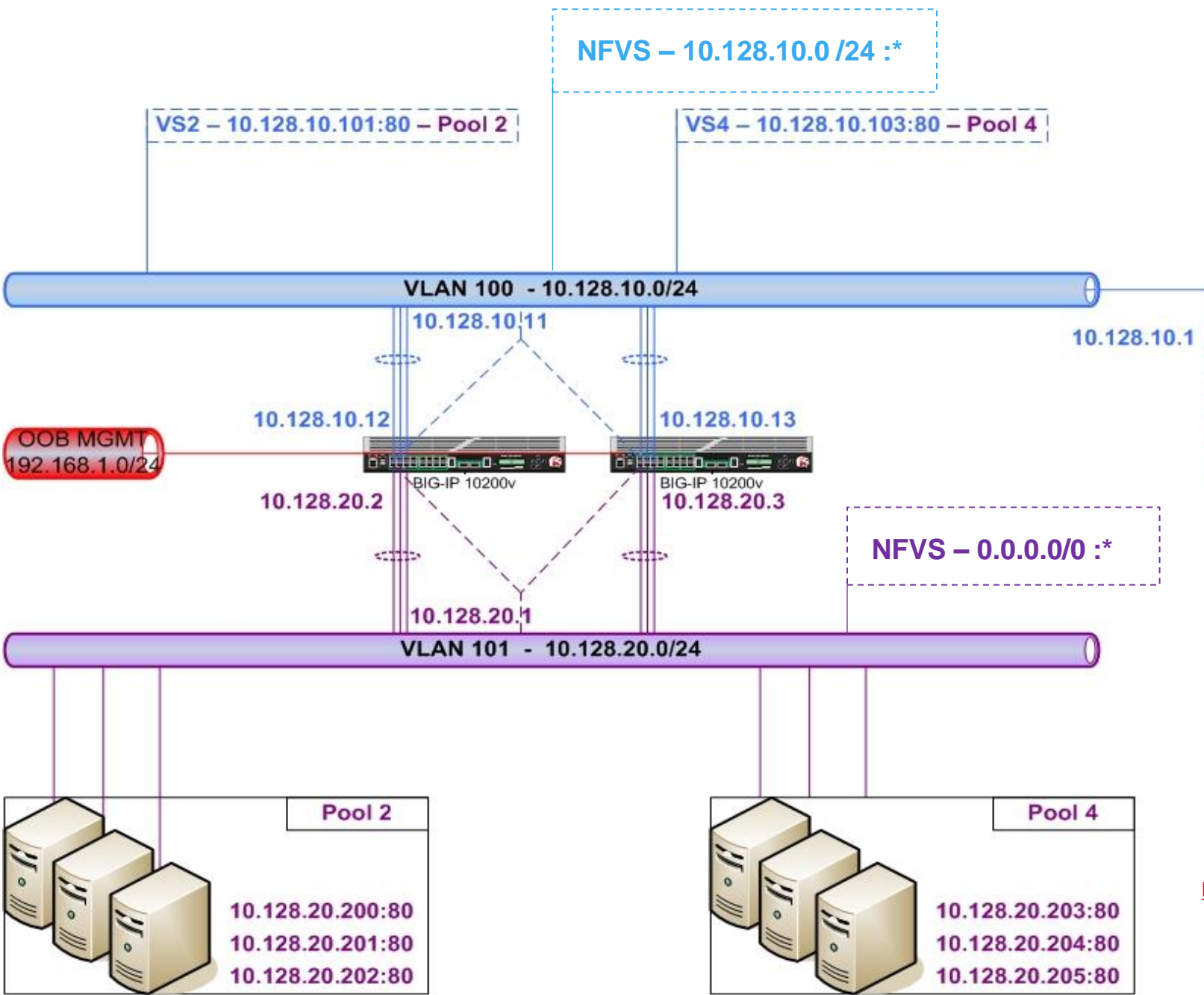
Determine switch, router, & application connectivity requirements



Router: Layer 3; forwards data packets between computer networks (WAN)

Firewall: Layer 3, 4; monitors & controls incoming/outgoing network traffic

Switch: Layer 2; connects devices using packet switching (LAN)



<https://clouddocs.f5.com/training/community/f5cert/html/class1/modules/module1.html>

Objective 1.03

GIVEN A SET OF REQUIREMENTS, ASSIGN IP ADDRESSES

- Interpret address and subnet relationships
 - <https://www.subnetting.net/>
- Understand public/private, multicast addressing, and broadcast
 - Class A: 0-127 first octet; Class B: 128-191 first octet; Class C: 192-223 first octet
- Explain the function and purpose of NAT and of DHCP
 - Network Address Translation / Dynamic Host Configuration Protocol
- Determine valid address IPv6
 - Example: convert IPv4 127.0.0.1 to IPv6 (<https://tools.ietf.org/html/rfc2373>)

Objective 1.04

STATE THE SERVICE THAT ARP PROVIDES

- Identify a valid MAC address (unique 48-bit hardware number, 6 octets; Hex)
 - Hyphen-Hexadecimal notation: 00-0a-83-b1-c0-8e
 - Colon-Hexadecimal notation: 00:0a:83:b1:c0:8e
 - Period-separated Hexadecimal notation: 00.0a.83.b1.c0.8e
- Define ARP and explain what it does
 - Address Resolution Protocol (https://en.wikipedia.org/wiki/Address_Resolution_Protocol)
- State the purpose of a default gateway
 - A node in a computer network acting as a forwarding host when no other route matches the destination IP address of a packet

Objective 1.05

GIVEN A SCENARIO, ESTABLISH REQUIRED ROUTING

- Explain why a route is needed
 - The process of selecting a path for traffic between networks or across multiple networks
- Explain network hops
 - The number of devices between the sending unit and the destination of the communication
- Given a destination IP address and routing table, identify a route to be used
 - Every computer that runs TCP/IP makes routing decisions based on the routing table
 - (C:\Users\mwoods> route print | more
 - https://en.wikipedia.org/wiki/Routing_table

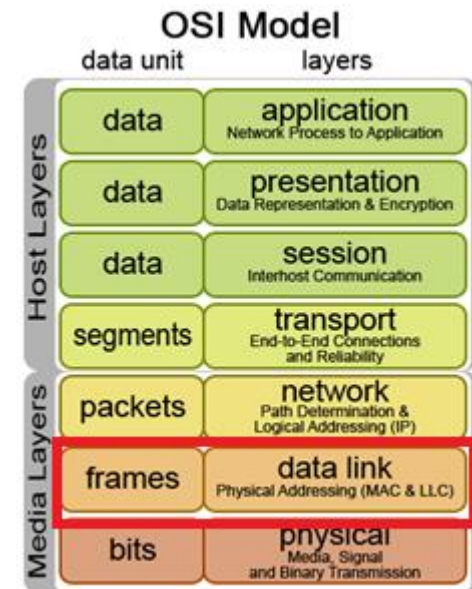
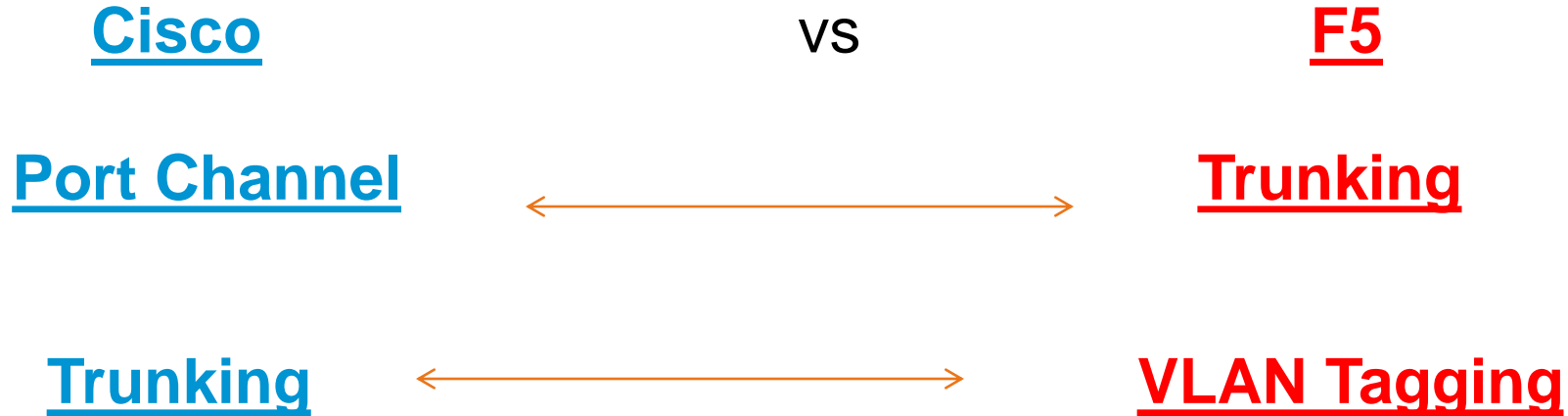
```
IPv4 Route Table
=====
Active Routes:

```

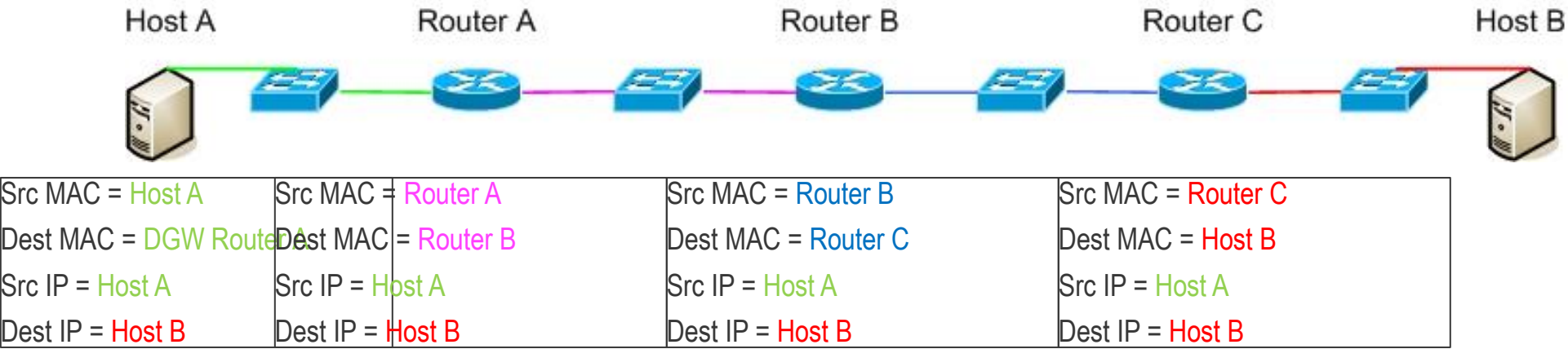
Network	Destination	Netmask	Gateway	Interface	Metric
	0.0.0.0	0.0.0.0	192.168.1.1	192.168.1.86	35
	10.1.1.0	255.255.255.0	On-link	10.1.1.1	291
	10.1.1.1	255.255.255.255	On-link	10.1.1.1	291
	10.1.1.255	255.255.255.255	On-link	10.1.1.1	291
	10.1.10.0	255.255.255.0	On-link	10.1.10.1	291
	10.1.10.1	255.255.255.255	On-link	10.1.10.1	291

Objective 1.02

Explain protocols and technologies specific to the data link layer



IP packet traversing a topology at each network hop



Objective 1.06

DEFINE ADC APPLICATION OBJECTS

- Define load balancing including intelligent load balancing and server selection
 - Virtual Servers – VIP's; also called Listeners (IP address and Port)
 - Pools – a logical set of devices; handles local distribution
 - Pool Members – a logical object that is associated with an IP address and Port number
 - Nodes – is a logical object on the BIG-IP system that identifies the IP address of a physical resource
- Explain features of an application delivery controller
 - A network device that routes client's requests for application services to the most available resource
- Explain benefits of an application delivery controller
 - Increase the efficiency, performance, security and reliability of applications

BIG-IP Configuration Utility – Network Map

HostnamebigipA.f5demo.com

IP Address10.1.1.245

DateMay 11, 2020


Time1:32 PM (EDT)

Useradmin

RoleAdministrator

Partition:Common

Log out





ONLINE (ACTIVE)
Standalone


Main


Help


About


 Statistics


 iApps


 DNS


 SSL Orchestrator

 Local Traffic

 Acceleration

 Device Management

 Network

 System

Local Traffic » Network Map

⚙️

Network Map

StatusAny Status

TypeAll Types

Search*

Search iRule Definition

Show Summary

Update Map

Local Traffic Network Map

⬢ http2_virtual

⬢ vs_http_80

⬢ 10.1.20.11:80

⬢ 10.1.20.12:80

⬢ http3_virtual

⬢ vs_http_80

⬢ 10.1.20.11:80

⬢ 10.1.20.12:80

⬢ vs_http_80

⬢ 10.1.20.11:80

⬢ 10.1.20.12:80

⬢ vs_stacy_80

⬢ stacy_http_80

⬢ 10.1.20.11:80

⬢ 10.1.20.12:80

⬢ 10.1.20.13:80

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Section 2: Troubleshooting

Objective 2.01

IDENTIFY GENERAL MEANINGS OF HTTP ERROR CODES

- Identify general meanings of HTTP error codes
 - (https://en.wikipedia.org/wiki/List_of_HTTP_status_codes)
- Identify reasons and methods for connection termination
 - TCP (FIN flag); HTTP (connection termination);
- Identify causes for failure to establish connection
 - Loss of network, URL error, mis-configure (putty session), etc.

1XX Informational	4XX Client Error Continued
100 Continue	409 Conflict
101 Switching Protocols	410 Gone
102 Processing	411 Length Required
	412 Precondition Failed
2XX Success	413 Payload Too Large
200 OK	414 Request-URI Too Long
201 Created	415 Unsupported Media Type
202 Accepted	416 Requested Range Not Satisfiable
203 Non-authoritative Information	417 Expectation Failed
204 No Content	418 I'm a teapot
205 Reset Content	421 Misdirected Request
206 Partial Content	422 Unprocessable Entity
207 Multi-Status	423 Locked
208 Already Reported	424 Failed Dependency
226 IM Used	426 Upgrade Required
	428 Precondition Required
3XX Redirectional	429 Too Many Requests
300 Multiple Choices	431 Request Header Fields Too Large
301 Moved Permanently	444 Connection Closed Without Response
302 Found	451 Unavailable For Legal Reasons
303 See Other	499 Client Closed Request
304 Not Modified	
305 Use Proxy	5XX Server Error
307 Temporary Redirect	500 Internal Server Error
308 Permanent Redirect	501 Not Implemented
	502 Bad Gateway
4XX Client Error	503 Service Unavailable
400 Bad Request	504 Gateway Timeout
401 Unauthorized	505 HTTP Version Not Supported
402 Payment Required	506 Variant Also Negotiates
403 Forbidden	507 Insufficient Storage
404 Not Found	508 Loop Detected
405 Method Not Allowed	510 Not Extended
406 Not Acceptable	511 Network Authentication Required
407 Proxy Authentication Required	599 Network Connect Timeout Error
408 Request Timeout	

HTTP STATUS CODES

When a browser requests a service from a web server, an error may occur.
This is a list of HTTP status messages that might be returned.

Objective 2.01: HTTP methods

IDENTIFY APPLICATION AND NETWORK ERRORS

GET	GET request method is used to get a web resource from the server.
HEAD	HEAD request method is used to get the header from GET method. Local cache copy information are available from the header.
POST	POST method posts data on the servers.
PUT	PUT method asks the server to store data.
DELETE	DELETE method asks the server to delete data.
TRACE	TRACE method asks the server to return an action trace for diagnosis.
OPTIONS	Options method asks the server to return the list of supported request methods.
CONNECT	CONNECT method tells proxy to connect to another host. It is mostly used to set up proxy SSL connections.

<https://en.wikipedia.org/wiki/CURL>

Objective 2.02

GIVEN A SCENARIO, VERIFY LAYER 2 MAPPING (TMSH “SHOW” COMMAND)

```
[root@bigipA:Active:Standalone] config #
[root@bigipA:Active:Standalone] config #
[root@bigipA:Active:Standalone] config # tms
root@(bigipA)(cfg-sync Standalone)(Active)(/Common)(tmos)#
root@(bigipA)(cfg-sync Standalone)(Active)(/Common)(tmos)#
root@(bigipA)(cfg-sync Standalone)(Active)(/Common)(tmos)# _
```

NAME

show command - Displays statistics for and the status of specified components.

MODULE

All tms modules.

SYNTAX

Use the **show** command within a **tms** module to display statistics for and the status of components in that module. To display statistics for and the status of components in another module, use the full path to the component.

```
show
show [component]
show [component] [name]
show / [module] [component] [name]
  options:
    all-stats
    current-module
    (default : exa : gig : kil : meg : peta : raw : tera : yotta : zetta
)
    (detail : global : historical)
```

Examples:

- Show ltm pool
- Show ltm virtual
- Show net vlan

- <https://clouddocs.f5.com/cli/tms-reference/latest/>

Objective 2.02

GIVEN A SCENARIO, VERIFY LAYER 2 MAPPING (ARP)

- **Explain one-to-one mapping of MAC to IP**
 - BIG-IP system supports Address Resolution Protocol (ARP), an industry-standard Layer 3 protocol.
 - Given a network diagram or ARP command output, determine if ARP resolution was successful

```
[root@bigipA:Active:Standalone] config # tmsh
root@(bigipA)(cfg-sync Standalone)(Active)(/Common)(tmsh)# show net arp all

-----
Net::Arp
Name      Address      HWaddress      Vlan          Expire-in-sec  Stat
us
-----
10.1.10.2  10.1.10.2    00:50:56:f3:3f:89 /Common/external 217            resolved
10.1.20.11 10.1.20.11   00:0c:29:5e:e4:66 /Common/internal 135            resolved
10.1.20.12 10.1.20.12   00:0c:29:5e:e4:66 /Common/internal 132            resolved
10.1.20.13 10.1.20.13   00:0c:29:5e:e4:66 /Common/internal 143            resolved

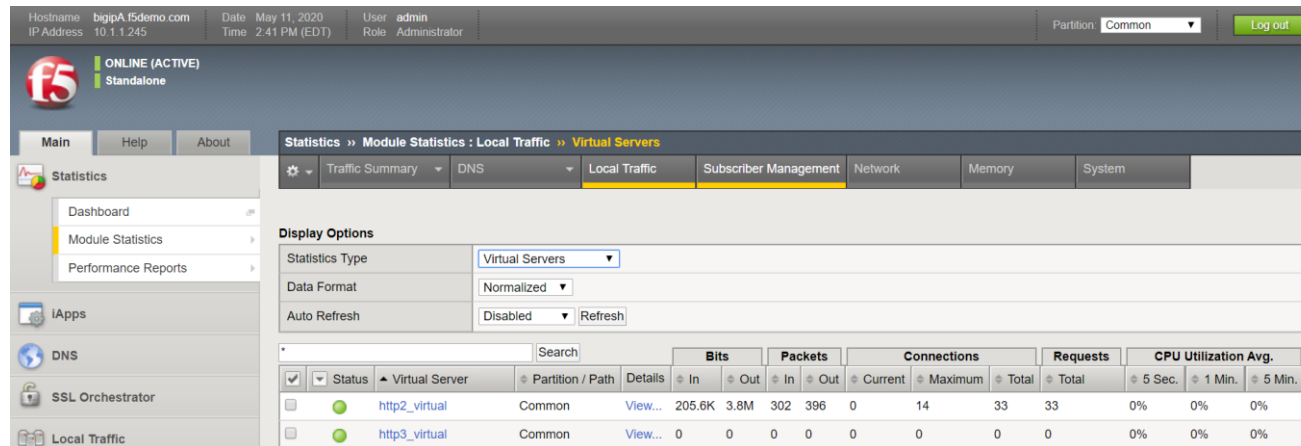
root@(bigipA)(cfg-sync Standalone)(Active)(/Common)(tmsh)#
```

- **Explain the purpose of MAC masquerading**
 - A unique, floating MAC address that you create/control
 - Minimizes ARP communications during failover; ensures traffic delivery without “re-learning”

Objective 2.03

GIVEN A SCENARIO, VERIFY TRAFFIC IS ARRIVING AT A DESTINATION

- Explain how to acquire packet captures
 - tcpdump: a command line utility line packet sniffer with many features and options
- View a packet capture and identify source and destination
 - tcpdump -i <interface>; example: tcpdump -i 1.1 | more (listening on interface 1.1)
 - tcpdump -i <VLAN>; example: tcpdump -i external | more (listening on external VLAN)
- Interpret statistics to show traffic flow



The screenshot displays the F5 Management Center interface. At the top, it shows system information: Hostname (bigipA.f5demo.com), Date (May 11, 2020), User (admin), and Role (Administrator). The main navigation bar includes 'Main', 'Help', and 'About'. The left sidebar contains links to 'Statistics', 'Dashboard', 'Module Statistics', 'Performance Reports', 'iApps', 'DNS', 'SSL Orchestrator', and 'Local Traffic'. The main content area is titled 'Statistics >> Module Statistics : Local Traffic >> Virtual Servers'. It features a 'Display Options' section with 'Statistics Type' set to 'Virtual Servers', 'Data Format' set to 'Normalized', and 'Auto Refresh' set to 'Disabled'. Below this is a table showing traffic statistics for two virtual servers: 'http2_virtual' and 'http3_virtual'. The table columns include Status, Virtual Server, Partition / Path, Details, In/Out Bits, In/Out Packets, Current/Maximum/Total Connections, Total Requests, and CPU Utilization (5 Sec, 1 Min, 5 Min).

Status	Virtual Server	Partition / Path	Details	Bits		Packets		Connections			Requests	CPU Utilization Avg.		
				In	Out	In	Out	Current	Maximum	Total		5 Sec.	1 Min.	5 Min.
ONLINE	http2_virtual	Common	View...	205.6K	3.8M	302	396	0	14	33	33	0%	0%	0%
ONLINE	http3_virtual	Common	View...	0	0	0	0	0	0	0	0	0%	0%	0%

Objective 2.04

GIVEN A SCENARIO, VERIFY LAYER 1 CONNECTIVITY

- Given an exhibit of the front ethernet panel, explain why there is an imbalance in link use
 - https://techdocs.f5.com/kb/en-us/archived_products/sam/manuals/product/pg_4300/pg_4300_lcdfunctions.html

State	Description
off (not lit)	No link.
amber solid	Linked at 1GbE.
amber blinking	Link is actively transmitting or receiving data at 1GbE.
green solid	Linked at 10GbE.
green blinking	Link is actively transmitting or receiving data at 10GbE.

- Interpret ifconfig output (interface bandwidth)
 - <https://en.wikipedia.org/wiki/Ifconfig>
- Explain potential L1 failure modes (duplex settings, cable out of specification)
 - Many possibilities: power outages, h/w failures, faulty SFP, EMI, etc.

Objective 2.04: F5 BIG-IP front ethernet panel

INTERPRET IFCONFIG OUTPUT (INTERFACE BANDWIDTH) [HTTPS://EN.WIKIPEDIA.ORG/WIKI/IFCONFIG](https://en.wikipedia.org/wiki/ifconfig)



```
[root@bigipA:Active:Standalone] config # ifconfig : more_  
  
eth0      Link encap:Ethernet  HWaddr 00:0C:29:AC:C9:69  
          inet6 addr: fe80::20c:29ff:feac:c969/64 Scope:Link  
          UP BROADCAST RUNNING ALLMULTI MULTICAST MTU:1500 Metric:1  
          RX packets:1018 errors:0 dropped:0 overruns:0 frame:0  
          TX packets:1527 errors:0 dropped:0 overruns:0 carrier:0  
          collisions:0 txqueuelen:1000  
          RX bytes:251246 (245.3 KiB)  TX bytes:1345901 (1.2 MiB)  
  
external  Link encap:Ethernet  HWaddr 00:0C:29:AC:C9:73  
          inet addr:10.1.10.240 Bcast:10.1.10.255 Mask:255.255.255.0  
          inet6 addr: fe80::20c:29ff:feac:c973/64 Scope:Link  
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0  
          TX packets:4 errors:0 dropped:0 overruns:0 carrier:0  
          collisions:0 txqueuelen:1  
          RX bytes:0 (0.0 b)  TX bytes:400 (400.0 b)  
  
internal  Link encap:Ethernet  HWaddr 00:0C:29:AC:C9:7D  
          inet addr:10.1.20.240 Bcast:10.1.20.255 Mask:255.255.255.0  
          inet6 addr: fe80::20c:29ff:feac:c97d/64 Scope:Link  
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  
          RX packets:313 errors:0 dropped:0 overruns:0 frame:0  
          TX packets:350 errors:0 dropped:0 overruns:0 carrier:0  
          collisions:0 txqueuelen:1
```

--More--

https://techdocs.f5.com/kb/en-us/products/big-ip_ltm/manuals/product/platform-i2000-i4000/1.html#guid-0f2cb19a-9ff1-4583-9f0a-0f3c2cc04a88

Section 3: Maintenance

Objective 3.01

GIVEN A SCENARIO, REVIEW BASIC STATS TO CONFIRM FUNCTIONALITY

- Interpret traffic object statistics
 - <https://clouddocs.f5.com/cli/tmsh-reference/latest/commands/show.html>
 - Show: use within “tmsh” (traffic management shell) to display statistics/status of components
- Interpret network configuration statistics

```
[root@bigipA:Active:Standalone] config #
[root@bigipA:Active:Standalone] config # tmsh
root@(bigipA)(cfg-sync Standalone)(Active)(/Common)(tmsh)#
root@(bigipA)(cfg-sync Standalone)(Active)(/Common)(tmsh)# show net interface
```

Net::Interface								
Name	Status	Bits In	Bits Out	Pkts In	Pkts Out	Drops	Errs	Media

1.1	up	1.0M	94.9K	657	184	0	0	10000T-FD
1.2	up	31.2M	4.3M	6.8K	7.2K	0	0	10000T-FD
1.3	uninit	0	0	0	0	0	0	none
mgmt	up	10.4M	26.6M	6.4K	6.5K	0	0	100TX-FD

```
root@(bigipA)(cfg-sync Standalone)(Active)(/Common)(tmsh)#
```

Objective 3.01

LOCAL TRAFFIC OBJECT STATISTICS

Hostnamebigip-A1.f5demo.comIP Address10.1.1.245

DateFeb 11, 2020Time8:12 AM (PST)

UseradminRoleAdministrator

Partition:Common

Log out

f5

ONLINE (ACTIVE)

Standalone

Main

Help

About

Statistics

Dashboard

Module Statistics

Analytics

Performance Reports

iApps

Wizards

DNS

Local Traffic

Traffic Intelligence

Acceleration

Statistics » Module Statistics : Local Traffic » Status Summary

Traffic Summary

DNS

Local Traffic

Subscriber Management

Network

Memory

System

Display Options

Statistics Type

Data Format

Auto Refresh

Local Traffic Summary

Object Type	Total
Virtual Servers	5
Pools	2
Nodes	7

✓ Status Summary

Virtual Servers

Virtual Addresses

Policies

Profiles Summary

Profiles - Statistics

Pools

iRules

iRules LX

Nodes

SNATs

SNAT Pools

SNAT Translations

NATs

Persistence Records

	Available	Unavailable	Offline	Unknown
Virtual Servers	2	0	0	3
Pools	2	0	0	0
Nodes	0	0	0	7

Objective 3.01

Local Traffic Object Statistics: *tmsh show ltm pool test2_pool*

```
-----  
Ltm::Pool: test2_pool  
-----
```

Status

```
Availability : available  
State       : enabled  
Reason      : The pool is available  
Monitor     : http  
Minimum Active Members : 0  
Current Active Members : 2  
    Available Members : 2  
    Total Members : 2  
        Total Requests : 0  
        Current Sessions : 0
```

Traffic

```
Bits In  
Bits Out  
Packets In  
Packets Out  
Current Connections  
Maximum Connections  
Total Connections
```

ServerSide

```
0  
0  
0  
0  
0  
0  
0
```

```
---(less 66%)---_
```

Objective 3.02


GIVEN A SCENARIO, DETERMINE DEVICE UPGRADE ELIGIBILITY

- Determine when to upgrade software
 - <https://devcentral.f5.com/s/articles/ihealth-upgrade-advisor-making-upgrades-a-little-easier-20001>
 - <https://support.f5.com/csp/article/K12878> (how to generate a qkview file; TMOS v13.x)
 1. Log in to the Configuration utility.
 2. Go to **System** > **Support**.
 3. Select **New Support Snapshot**.
 4. For **Health Utility**, select **Generate QKView**.
 5. Select **Start**.
 6. To download the output file, select **Download**.
- Determine when to upgrade platform (considerations: end of sale; end of new s/w support, etc.)
 - <https://support.f5.com/csp/article/K4309>
- Determine steps to minimize upgrade downtime (open a support ticket; contact F5 PS)
 - <https://support.f5.com/csp/article/K84554955>

Objective 3.02

GIVEN A SCENARIO, DETERMINE DEVICE UPGRADE ELIGIBILITY

F5.COM





AskF5

Knowledge Centers

Resources


Search AskF5






 Mar 27, 2020 For emerging BIG-IP APM issues you may experience during the COVID-19 outbreak, refer to [K21883200](#).

[AskF5 Home](#) / [K13123](#)

K13123: Managing BIG-IP product hotfixes (11.x - 15.x)

 Non-Diagnostic



Original Publication Date: Oct 23, 2015
Updated Date: Oct 03, 2019

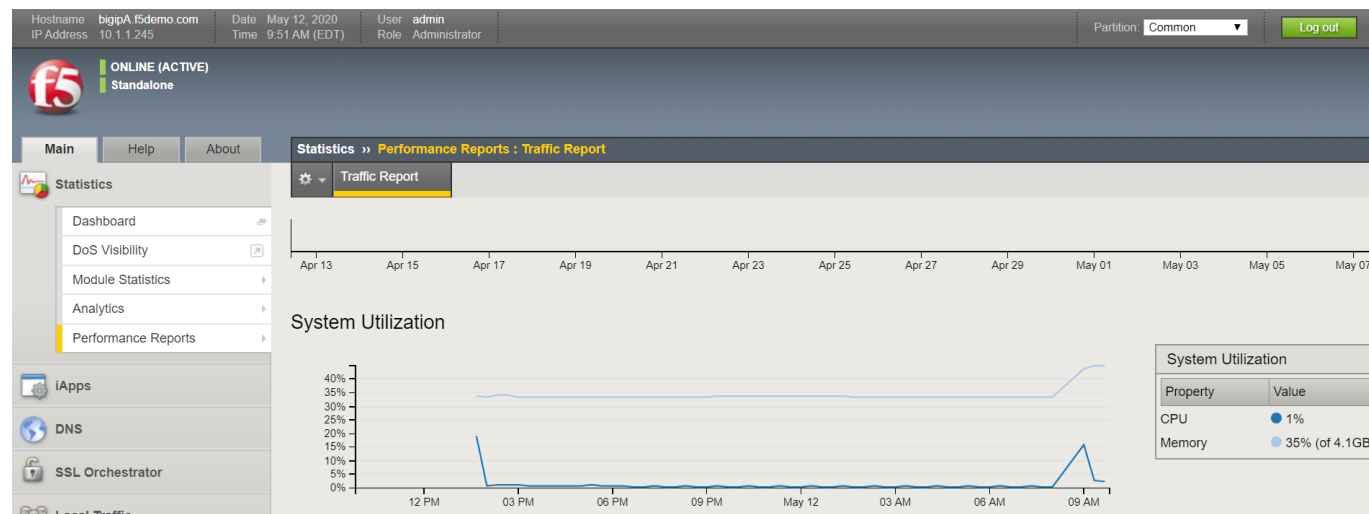
Applies to (see versions): ▼

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Objective 3.03

GIVEN A SCENARIO, INTERPRET TRAFFIC FLOW

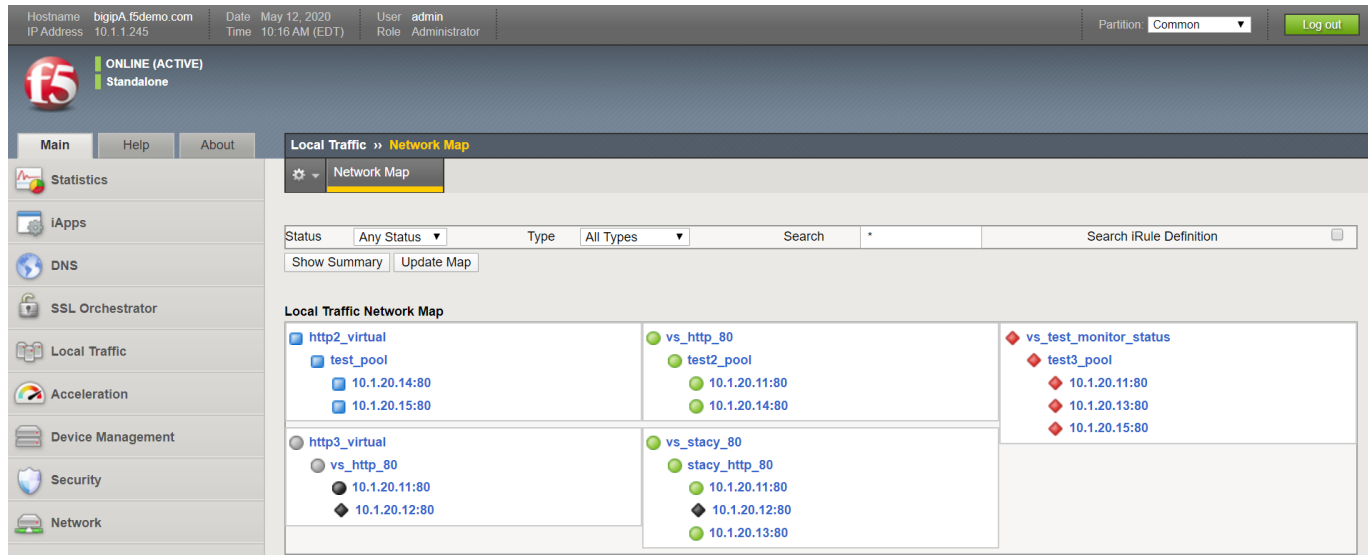
- Explain application client-server communication
 - https://en.Wikipedia.org/wiki/Client-server_model
- Interpret traffic graphs (Interpret SNMP results)
 - https://techdocs.f5.com/kb/en-us/products/big-ip_ltm/manuals/product/bigip-external-monitoring-implementations-13-1-0/13.html#guid-e3d151c1-c6ef-413e-9e16-d41411ff7b1e



Objective 3.04

GIVEN A SCENARIO, INTERPRET SERVICE STATUS

- Compare active vs inactive ADC elements (<https://support.f5.com/csp/article/K12213214>)



- Infer services for given netstat output
 - https://en.wikipedia.org/wiki/List_of_TCP_and_UDP_port_numbers
- Determine whether a service is listening on a given port based on netstat output
 - <https://www.thegeekstuff.com/2010/03/netstat-command-examples/>

Objective 3.05


GIVEN A SCENARIO, INTERPRET SYSTEM HEALTH


- Generate a Qkview and upload to iHealth
 - <https://support.f5.com/csp/article/K12878#5>
- Review logs
 - <https://support.f5.com/csp/article/K16197>
- Ensure efficacy of maintenance tasks (alert endpoints, verify backups)
 - <https://support.f5.com/csp/article/K34421741>
- Review system vitals (disk space, CPU load, memory, bandwidth)
 - https://techdocs.f5.com/kb/en-us/products/big-ip_analytics/manuals/product/analytics-implementations-13-1-0/8.html


Objective 3.05

Here is a screenshot of the iHealth Report

MickeyUpload☒ All UsersFind QKViewsImpersonateSettingsWhat's new?FeedbackAboutF5 HomeiHealth HomeLog out

F5 iHealth


5New iHealth version was released on 16 April 2020.
[Release notes](#)

page guide

[← QKView List](#)

QKViewbigip.example.com.tgzGeneration DateTue, 19 May 2020 11:38:31 -0700F5 Support Case (SR)[none]

Hostnamebigip.example.comPlatform()Version - Edition10.1.0 - Final

Status


Overview


Hardware


Software

High Availability

Licensing




Commands



Diagnostics


Files



Status

Diagnostics

Results 57 High 39 Medium 31 Low

Evaluation A large number of issues found! Upgrade options are not available

Status No new potential issues identified since last update.

Links PDF CSV

File

Upload DateMay 19 2020, 06:38:31 PM (GMT)

Uploaded Bym.woods@f5.com

F5 Support Case (SR)[none]

Description[none]

Quick Links

BIG-IP conf/config/bigip.conf

BIG-IP base/config/bigip_base.conf

BIG-IP local/config/bigip_local.conf

BIG-IP system/config/bigip_sys.conf

LTM log/var/log/ltm

TMM log/var/log/tmm

GTM log/var/log/gtm

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Section 4: Knowledge

Objective 4.01

EXPLAIN COMMON USES FOR ICMP

- Explain the purpose of an IP TTL
 - https://en.wikipedia.org/wiki/Time_to_live
- Explain the purpose of HTTP keep-alive
 - <https://en.wikipedia.org/wiki/Keepalive>
- Explain the purpose of ICMP echo request/reply
 - [https://en.wikipedia.org/wiki/Ping_\(networking_utility\)](https://en.wikipedia.org/wiki/Ping_(networking_utility))
- Explain reasons for ICMP unreachable
 - https://en.wikipedia.org/wiki/Internet_Control_Message_Protocol








Objective 4.02

MAP FUNCTIONALITY TO OSI MODEL

- Identify the layer for a MAC address
- Identify the layer for a UDP/TCP port
- Identify the layer for an IP address
- Identify the layer for applications

https://en.wikipedia.org/wiki/OSI_model

OSI Layer

	Device	PDU	Layers	Layer No	Implementaion & Protocols	Application Examples	
<div> <div>Encapsulation</div> <div> <div>Host Layer</div> <div>Media Layer</div> </div> </div>	Firewall	data	Application 	7	DHCP, DNS, FTP, HTTP, IMAP4, NNTP, POP3, SMTP, SNMP, SSH, TELNET & NTP	End User Layer Program that opens what was sent or creates what is to be sent • Resource sharing • Remote file access • Remote Printer Access • Directory Services • Network Management	Upper Layer
	Firewall	data	Presentation 	6	SSL, WEP, WPA, Kerberos, MIME & XDR	Syntax layer encrypt & decrypt (if required) • Character Code translation • Data conversion • Data Compression • Data encryption • Character set Translation	
	Firewall	data	Session 	5	Dialog control Named pipe NetBIOS SAP PPTP RTP SOCKS SPDY TLS/SSL	Synch & send to ports (Interhost communication) • Session establishment, maintenance and termination • Session support - perform security, name recognition, logging, etc	
	Gateway	segements	Transport 	4	TCP, UDP, SCTP, DCCP & SPX	TCP Host to Host, Flow control (logical ports) • Message segmentation • Message acknowledgement • Message traffic control • Session multiplexing	Lower Layer
	Router IP/IPX/ICMP	packet	Network 	3	IPv4, IPV6, IPX, Apple Talk, OSPF, ICMP,IGMP, and ARPMP	Packets ("letter", contains IP address) • Routing • Subnet traffic control • Frame fragmentation • Logical-physical address mapping • Subnet usage accounting	
	Switch,Bridge & WAP PPP/SLIP	frame	Data link 	2	802.11 (WLAN), Wi-Fi, WiMAX, ATM, Ethernet, Token Ring, Frame Relay, PPTP, L2TP and ISDN-ore	Frames ("envelops" contain MAC address) [NIC card -----Switch----- NIC card] end to end • Establishment & terminates the logical link between nodes • Frame traffic control • Frame Sequencing • Frame acknowledgment • Frame delimiting • Frame error checking • Media access control	
	Hubs, Repeaters	bits	Physical 	1	Hubs, Repeaters, Cables, Optical Fiber, SONET/SDN,Coaxial Cable, Twisted Pair Cable and Connectors	Physical structure Cables, hubs, etc • Data encoding • Physical medium attactment • Trasmission technique • Baseband vs Broadband • Physical medium tansmission Bits & Volts	

Source : davidprasad.blogspot.in

Objective 4.03

EXPLAIN USE OF TLS/SSL

- Explain the purpose of TLS/SSL certificates (self signed vs CA signed)
 - https://en.wikipedia.org/wiki/Transport_Layer_Security
- Explain the rationale for using TLS/SSL
 - https://en.wikipedia.org/wiki/Transport_Layer_Security
- Explain TLS/SSL traffic flow scenarios in BIG-IP
 - <https://techdocs.f5.com/en-us/bigip-15-1-0/big-ip-system-ssl-administration.html>

Objective 4.04

EXPLAIN THE FUNCTION OF A VPN

- Explain the rationale for using VPN (privacy, encryption, anonymity)
 - https://en.wikipedia.org/wiki/Virtual_private_network
 - VPN technology was developed to allow remote users and branch offices to access corporate applications and resources using an encrypted layered tunneling protocol, and authentication methods including passwords or certificates, to gain access to the VPN...
- Identify valid uses for VPN
 - <https://www.f5.com/services/resources/glossary/ssl-vpn>
 - IPsec: most useful for establishing VPN between two fixed end-points (such as two offices or for, site-to-site tunnel communications)

Objective 4.05

EXPLAIN HIGH AVAILABILITY (HA) CONCEPTS

- Explain methods of providing HA integrity
 - Operational performance and system uptime; NO single points of failure!
- Explain methods of providing HA
 - F5 BIG-IP HA pair: Active-Active or Active-Standby
 - Device Service Clustering
 - https://techdocs.f5.com/kb/en-us/products/big-ip_ltm/manuals/product/bigip-system-device-service-clustering-administration-13-1-0.html
- Explain advantages of HA
 - https://en.wikipedia.org/wiki/High_availability

Objective 4.06

EXPLAIN REASONS FOR SUPPORT SERVICES (DNS, NTP, SYSLOG, SNMP, R ETC)

- Explain the purpose of DNS (Domain Name System)
 - Associates a common name with an IP address (port 53) and is a “phone book” for the Internet
- Select the appropriate tool to confirm DNS resolution is successful for a host name
 - <https://blog.dnsimple.com/2015/02/top-dns-lookup-tools/> (nslookup, dig, ..)
- Explain what syslog is <https://en.wikipedia.org/wiki/Syslog>
- Explain the purpose of NTP https://en.wikipedia.org/wiki/Network_Time_Protocol
- Explain SNMP as it pertains to ADC element monitoring (SNMP: ports 161/162)
 - <https://support.f5.com/csp/article/K4026>

Secret Sauce!

- Know thyself! Morning person or afternoon person? Schedule exams accordingly
- Prometric has been added as an authorized testing facility (after a several year hiatus)
- 2 forms of photo ID required (license or company badge, and passport for example)
- Dedicate enough time for exam preparation!
- Answer all questions the first time through – no exceptions!
- Mark 10 questions for review at most
- Do NOT change an answer unless you are 100% sure you have initially answered wrong. Your first, best guess is usually correct (you don't want changing a correctly answered question!)
- Use the F5 exam “Blueprint” to understand what topics you will be tested on
- A minute to win it!
- 67.5 seconds per question (80 questions, 90 minutes – do the math..)
- F5 is VERY good at presenting “distractors” to students
- When trying to fill knowledge gaps, map the testing topic section to a Knowledge (K) document
- Aim high, and fight for every question
- Taking a practice exam is absolutely recommended (\$25 for each, \$40 for two) – no more than 2 attempts

The great Vince Lombardi told his new team in 1959 that they were going to relentlessly chase perfection. We will never get there, but in the process, we will catch excellence!

What's Next F5 202 or F5 201?

F5 Certification Exams



Solutions Expert

Security Solutions **401**

Cloud Solutions **402**

Future Enterprise

Future Exams



Technology Specialist

LTM Specialist (b) **301b**

LTM Specialist (a) **301a**

DNS Specialist **302**

ASM Specialist **303**

APM Specialist **304**

Future Exams



Administrator

TMOS Administration **201**

Future Exams

Pre-Sales Fundamentals **202**

Application Delivery Fundamentals **101**



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