301B — BIG-IP LTM Specialist:
Maintain and Troubleshoot

ABOUT THE *301B – BIG-IP LTM SPECIALIST: MAINTAIN AND TROUBLESHOOT* EXAM

The *301B – BIG-IP LTM Specialist: Maintain and Troubleshoot* exam is the second exam required to achieve F5 Certified Technology Specialist, Local Traffic Manager (F5-CTS, LTM) status.

This exam identifies individuals qualified to design, implement, maintain, and troubleshoot advanced F5 product features to enhance the effectiveness of an Application Delivery Network (ADN). They possess understanding of underlying principles—from SSL-based VPN implementation to symmetric and asymmetric acceleration—and can draw on that insight to integrate Local Traffic Manager (LTM) into existing networks as well as new implementations.

WHAT IS THE *301B – BIG-IP LTM SPECIALIST: MAINTAIN AND TROUBLESHOOT* 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. They contain section levels, objectives and examples, and can be used to identify areas for additional study. The examples are illustrative, not exhaustive.

F5 Certification exams are designed to test the knowledge, skills, and abilities of the candidate. These exams are not designed to test version-specific TMOS features, but rather assess knowledge and understanding of F5 technology solutions for which the exam is developed.

PREREQUISITE:

F5 Certified BIG-IP Administrator (F5-CA)
301A – BIG-IP LTM Specialist: Architect, Set-up and Deploy

CREDENTIAL AWARDED:

F5 Certified Technology Specialist, Local Traffic Manager (F5-CTS, LTM)

Section 1 : TROUBLESHOOT BASIC VIRTUAL SERVER CONNECTIVITY ISSUES	
Objectives and Examples	**CC***
1.01 **Given a scenario, determine the appropriate profile setting modifications** • Given a scenario of client or server side buffer issues, packet loss, or congestion, select the appropriate TCP or UDP profile to correct the issue • Given a scenario determine when an application would benefit from HTTP Compression and/or Web Acceleration profile	A/E
1.02 **Given a sub-set of an LTM configuration, determine which objects to remove or consolidate to simplify the LTM configuration** • Evaluate which iRules can be replaced with a profile or policy setting • Evaluate which host virtual servers would be better consolidated into a network virtual server	A/E
1.03 **Given a set of LTM device statistics, determine which objects to remove or consolidate to simplify the LTM configuration** • Identify redundant and/or unused objects • Identify unnecessary monitoring • Interpret configuration and performance statistics • Explain the effect of removing functions from the LTM device configuration	U/A
1.04 **Given a scenario, determine the appropriate upgrade and recovery steps required to restore functionality to LTM devices** • Identify the appropriate methods for a clean install • Identify the TMSH sys software install options required to install a new version • Identify the steps required to upgrade the LTM device such as: license renewal, validation of upgrade path, review release notes, etc. • Identify how to copy a config to a previously installed boot location/slot • Identify valid rollback steps for a given upgrade scenario	R
1.05 **Given a scenario, determine the appropriate upgrade steps required to minimize application outages** • Explain how to upgrade an LTM device from the GUI • Describe the effect of performing an upgrade in an environment with device groups and traffic groups • Explain how to perform an upgrade in a high availability group	U/A
1.06 **Describe the benefits of custom alerting within an LTM environment** • Describe how to specify the OIDs for alerting • Explain how to log different levels of local traffic message logs • Explain how to trigger custom alerts for testing purposes	U/A
1.07 **Describe how to set up custom alerting for an LTM device** • List and describe custom alerts: SNMP, email and Remote Syslog • Identify the location of custom alert configuration files • Identify the available levels for local traffic logging	R

* Cognitive Complexity Key: **R** = Remember, **A/E** = Analyze/Evaluate, **U/A** = Understand/Apply

Section 2 : IDENTIFY AND RESOLVE APPLICATION ISSUES	
Objectives and Examples	**CC***
2.01 **Determine which iRule to use to resolve an application issue** • Determine which iRule events and commands to use • Given a specific iRule event determine what commands are available	**U/A**
2.02 **Explain the functionality of a simple iRule** • Interpret information in iRule logs to determine the iRule and iRule events where they occurred • Describe the results of iRule errors	**U/A**
2.03 **Given specific traffic and configuration containing a simple iRule determine the result of the iRule on the traffic** • Use an iRule to resolve application issues related to traffic steering and/or application data	**A/E**
2.04 **Interpret AVR information to identify performance issues or application attacks** • Explain how to modify profile settings using information from the AVR • Explain how to use advanced filters to narrow output data from AVR • Identify potential latency increases within an application	**U/A**
2.05 **Interpret AVR information to identify LTM device misconfiguration** • Explain how to use AVR to trace application traffic • Explain how latency trends identify application tier bottlenecks	**U/A**
2.06 **Given a set of headers or traces, determine the root cause of an HTTP/HTTPS application problem** • Explain how to interpret response codes • Explain the function of HTTP headers within different HTTP applications (Cookies, Cache Control, Vary, Content Type & Host) • Explain HTTP methods (GET, POST, etc.) • Explain how to decode POST data	**U/A**
2.07 **Given a set of headers or traces, determine a solution to an HTTP/HTTPS application problem** • Investigate the cause of a specific response code • Investigate the cause of an SSLHandshake failure • Predict the browser caching behavior when application data is received (headers and HTML)	**A/E**
2.08 **Given a direct trace, a trace through the LTM device, and other relevant information, compare the traces to determine the root cause of an HTTP/HTTPS application problem** • Given a failed HTTP request and LTM configuration data determine if the connection is failing due to the LTM configuration	**A/E**

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2.09	**Given a direct trace, a trace through the LTM device, and other relevant information, compare the traces to determine a solution to an HTTP/HTTPS application problem** • Investigate the cause of an SSLHandshake failure • Given a failed HTTP request and LTM configuration data determine if the connection is failing due to the LTM configuration	A/E
2.10	**Given a scenario, determine which protocol analyzer tool and its options are required to resolve an application issue** • Identify application issues based on a protocol analyzer trace • Explain how to follow a conversation from client side and server side traces • Explain how SNAT and OneConnect effect protocol analyzer traces • Explain how to decrypt SSL traffic for protocol analysis • Explain how to recognize the different causes of slow traffic (e.g., drops, RSTs, retransmits, ICMP errors, demotion from CMP)	U/A
2.11	**Given a trace and necessary supporting documentation, determine the root cause of an application problem** • Analyze a tcpdump to identify application or configuration problems	A/E
2.12	**Given a trace and necessary supporting documentation, determine a solution to an application problem** • Analyze a tcpdump to identify application or configuration problems	A/E
2.13	**Given a scenario, determine from where the protocol analyzer data should be collected** • Explain how to decrypt SSL traffic for protocol analysis • Explain how to recognize the different causes of slow traffic (e.g., drops, RSTs, retransmits, ICMP errors, demotion from CMP) • Choose the appropriate protocol analyzer for troubleshooting a given problem (e.g., Wireshark, tcpdump, ssldump) • Identify application issues based on a protocol analyzer trace • Explain how SNAT and OneConnect effect protocol analyzer traces	U/A
2.14	**Given a trace, identify monitor issues** • Explain how to capture and interpret monitor traffic using protocol analyzer • Explain how to obtain needed input and output data to create the monitors	U/A
2.15	**Given a monitor issue, determine an appropriate solution** • Determine appropriate monitor and monitor timing based on application and server limitations • Describe how to modify monitor settings to resolve monitor problems	U/A

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Section 3 : IDENTIFY AND RESOLVE LTM DEVICE ISSUES	
Objectives and Examples	**CC***
3.01 **Interpret log file messages and/or command line output to identify LTM device issues** • Interpret log file messages to identify LTM device issues • Interpret the qkview heuristic results • Identify appropriate methods to troubleshoot NTP • Identify license problems based on the log file messages and statistics	U/A
3.02 **Identify the appropriate command to use to determine the cause of an LTM device problem** • Identify hardware problems based on the log file messages and statistics • Identify resource exhaustion problems based on the log file messages and statistics • Identify connectivity problems based on the log files • Determine the appropriate log file to examine to determine the cause of the problem	U/A
3.03 **Analyze performance data to identify a resource problem on an LTM device** • Analyze performance data to identify a resource problem on an LTM device	A/E
3.04 **Given a scenario, determine the cause of an LTM device failover** • Explain the effect of network failover settings on the LTM device • Explain the relationship between serial and network failover • Differentiate between unicast and multicast network failover modes • Identify the cause of failover using logs and statistics	U/A
3.05 **Given a scenario, determine the cause of loss of high availability and/or sync failure** • Explain how the high availability concepts relate to one another • Explain the relationship between device trust and device groups • Identify the cause of config sync failures • Explain the relationship between traffic groups and LTM objects • Interpret log messages to determine the cause of high availability issues	U/A

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Exam Details

HOW MUCH DO F5 EXAMS COST?

All F5 exams are currently priced at US$180 (not including local taxes and fees) per exam, per attempt.

HOW LONG ARE F5 EXAMS?

This exam is 90 minutes long (not including any non-native English or other accommodations).

WHAT IS THE PASSING SCORE FOR F5 EXAMS?

F5 exams require a passing score of 245 out of a range between 100 and 350.

SCALED SCORING

Scaled scores ensure that the reported scores across exam forms and versions have the same meaning regardless of difficulty. Fair and consistent decisions can then be made about exam results regardless of the exam form or version. More information ›

HOW MANY QUESTIONS ARE THERE?

This exam has 80 questions (70 items that are scored, 10 pilot/beta items).

WHAT FORMAT ARE F5 EXAMS?

F5 exams are all computer-based, multiple-choice-response exams. Some questions contain exhibits or scenarios that you will need to view in order to answer the question.

WHAT IS THE F5 RETAKE POLICY?

1st failure: Exam hold for 15 days (You cannot take the exam again for 15 days.)
2nd failure: Exam hold for 30 days
3rd failure: Exam hold for 45 days
4th failure: Exam hold for 365 days
5th and subsequent failed attempts: 90 days

Cognitive Complexity Descriptions

Lower Order Thinking Skills ➜ Higher Order Thinking Skills

Remember	Understand/Apply	Analyze/Evaluate	Create
Information retrieval	Knowledge transfer	Critical thinking and reasoning	Innovation or creative thinking
Rote memorization	Comprehension or ability to apply knowledge to a standard process	Determine how parts relate to whole or knowledge integration and application to new situations	Forming an original work product
Retrieve relevant knowledge from long-term memory	Construct meaning from information	Make judgments based on criteria	Combine or reorganize parts to form a new pattern or structure
E.g., recall, retrieve, recognize	E.g., interpret, classify, compare, explain, implement	E.g., troubleshoot, attribute, diagnose, critique	E.g., generate, plan, produce

Alpine Testing Solutions' suggested cognitive complexity levels and associated verb references consider multiple approaches to defining cognitive processing (e.g., Anderson et al., Webb, Bloom, Frisbie). Above material created with assistance from Alpine and distributed with Alpine's permission as an attachment to certification test

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