Developing iRules for BIG-IP

Kód kurzu: F5_IRULES

Na tomto F5 certifikovaném kurzu síťoví profesionálové pochopí, jak fungují iRules a naučí se, jak správně tyto skripty vyvíjet.Kurz staví na základech kurzu Administering BIG-IP a ukazuje, jak logicky plánovat a psát iRules, tak aby pomohly řídit úkoly spojené se zpracováním provozu na BIG-IP, nebo provoz monitorovat. Kurz se skládá z psaní, aplikování a vyhodnocování vlivu iRules na provoz LTM. Tento praktický kurz zahrnuje přednášky, laby a diskuse.

Pro koho je kurz určen

This course is intended for system administrators, network administrators and application developers responsible for the customization of traffic flow through a BIG-IP system using iRules.

Co Vás naučíme

Topics Covered

- Setting up the BIG-IP system
- Getting started with iRules
- Leveraging DevCentral resources for iRule development
- Exploring iRule elements, including events, functions, commands, variables, and operators
- Using control structures for conditional branching and looping
- Mastering whitespace, grouping, and special symbols
- Measuring iRule efficiency using timing statistics
- Logging from an iRule using syslog-ng and high-speed logging (HSL)
- Optimizing iRules execution, including implementing efficiency best practices
- Modularizing iRules for administrative efficiency, including using procedures
- Securing web applications with iRules, including preventing common HTTP attacks, securing HTTP headers and cookies, and implementing HTTP strict transport security (HSTS)
- Working with strings, including using Tcl parsing commands and iRules parsing functions
- Accessing and manipulating HTTP traffic, including applying selective HTTP compression
- Working with iFiles and data groups
- Using iRules with universal persistence and stream profiles
- Gathering statistics using STATS and ISTATS
- Incorporating advanced variables, including arrays, static variables, and the session table

At the end of this course, the student will be able to:

- Describe the role of iRules in customizing application delivery on a BIG-IP system
- Describe best practices for using iRules
- Define event context, and differentiate between client-side and server-side contexts, request and response contexts, and local and remote contexts
- Trigger an iRule for both client-side and server-side request and response events
- Assign multiple iRules to a virtual server and control the order in which duplicate events trigger
- Describe and use a testing methodology for iRule development and troubleshooting
- Use local variables, static variables, lists, arrays, the session table, and data groups to store information needed for iRule execution

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- Write iRules that are optimized for runtime and administrative efficiency
- Use control structures to conditionally branch or loop within an iRule
- Log from an iRule using Linux syslog-ng or TMOS high-speed logging (HSL)
- Incorporate coding best practices during iRule development
- Use analyzer tools to capture and view traffic flow on both client-side and server-side contexts
- Collect and use timing statistics to measure iRule runtime efficiency
- Write iRules to help mitigate and defend from some common HTTP attacks
- Differentiate between decimal, octal, hexadecimal, floating-point, and exponential notation
- Parse and manipulate strings using Tcl commands and iRule functions
- Write iRules to access and manipulate HTTP header information
- Write iRules to collect customized statistics
- Implement universal persistence via an iRule
- Modify payload content using an iRule with a stream profile

Požadované vstupní znalosti

The following free web-based courses, although optional, will be very helpful for any student with limited BIG-IP administration and configuration experience.
These courses are available at LearnF5 (https://www.f5.com/services/training):

- Getting Started with BIG-IP
- Getting Started with BIG-IP Local Traffic Manager (LTM)

The following general network technology knowledge and experience are recommended before attending any F5 Global Training Services instructor-led course:

- OSI model encapsulation
- Routing and switching
- Ethernet and ARP
- TCP/IP concepts
- IP addressing and subnetting
- NAT and private IP addressing
- Default gateway
- Network firewalls
- LAN vs. WAN

The following course-specific knowledge and experience is suggested before attending this course:

- HTTP protocol
- Any programming language

Osnova kurzu

Chapter 1: Setting Up the BIG-IP System

- Introducing the BIG-IP System
- Initially Setting Up the BIG-IP System
- Archiving the BIG-IP System Configuration

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- Leveraging F5 Support Resources and Tools

Chapter 2: Getting Started with iRules
- Customizing Application Delivery with iRules
- Triggering an iRule
- Leveraging the DevCentral Ecosystem
- Creating and Deploying iRules

Chapter 3: Exploring iRule Elements
- Introducing iRule Constructs
- Understanding iRule Events and Event Context
- Working with iRule Commands
- Logging from an iRule Using SYSLOG-NG (LOG Command)
- Working with User-Defined Variables
- Working with Operators and Data Types
- Working with Conditional Control Structures (IF and SWITCH)
- Incorporating Best Practices in iRules

Chapter 4: Developing and Troubleshooting iRules
- Mastering Whitespace and Special Symbols
- Grouping Strings
- Developing and Troubleshooting Tips
- Using Fiddler to Test and Troubleshoot iRules

Chapter 5: Optimizing iRule Execution
- Understanding the Need for Efficiency
- Measure iRule Runtime Efficiency Using Timing Statistics
- Modularizing iRules for Administrative Efficiency
- Using Procedures to Modularize Code
- Optimizing Logging
- Using High-Speed Logging Commands in an iRule
- Implementing Other Efficiencies
- Using Looping Control Structures (WHILE, FOR, FOREACH Commands)

Chapter 6: Securing Web Applications with iRules
- Integrating iRules into Web Application Defense
- Mitigating HTTP Version Attacks
- Mitigating Path Traversal Attacks
- Using iRules to Defends Against Cross-Site Request Forgery (CSRF)
- Mitigating HTTP Method Vulnerabilities
- Securing HTTP Cookies with iRules
- Adding HTTP Security Headers
- Removing Undesirable HTTP Headers

Chapter 7: Working with Numbers and String
- Understanding Number Forms and Notation
- Working with Strings (STRING and SCAN Commands)
- Combining Strings (Adjacent Variables, CONCAT and APPEND Commands)
- Using iRule String Parsing Functions (FINDSTR, GETFIELD, and SUBSTR Commands)

Chapter 8: Processing the HTTP Payload
- ?Reviewing HTTP Headers and Commands
- Introducing iRule HTTP Header Commands
- Accessing and Manipulating HTTP Headers (HTTP::header Commands)

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- Other HTTP commands (HTTP::host, HTTP::status, HTTP::is_keepalive, HTTP::method, HTTP::version, HTTP::redirect, HTTP::respond, HTTP::uri)
- Parsing the HTTP URI (URI::path, URI::basename, URI::query)
- Parsing Cookies with HTTP::cookie
- Selectively Compressing HTTP Data (COMPRESS Command)

Chapter 9: Working with iFiles and Data Groups

- Working with iFiles
- Working with Data Groups
- Working with Old Format Data Groups (MATCHCLASS, FINDCLASS)
- Working with New Format Data Groups (CLASS MATCH, CLASS SEARCH)

Chapter 10: Using iRules with Universal Persistence, Stream, and Statistics Profiles

- Implementing Universal Persistence (PERSIST UIE Command)
- Working with the Stream Profile (STREAM Command)
- Collecting Statistics Using a Statistics Profile (STATS Command)
- Collecting Statistics Using iStats (ISTATS Command)

Chapter 11: Incorporating Advanced Variables

- Reviewing the Local Variable Namespace
- Working with Arrays (ARRAY Command)
- Using Static and Global Variables
- Using the Session Table (TABLE Command)
- Processing Session Table Subtables
- Counting "Things" Using the Session Table

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