Ensuring Application Quality Through Automated Monitoring With Nagios

Ethan Galstad
Code Freeze 2012
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Code Freeze 2012
About Me

- Ethan Galstad
- Founder of Nagios
- Past Experience
  - Helpdesk
  - Desktop Support
  - Sys/Net Admin
  - Developer
Why Does Monitoring Matter?
Why Monitoring Matters

- Problem Alerts → Faster Fixes
- Visibility → Proactive Planning
- Instant Awareness → Reduced Downtime
What Is Nagios?
What Is Nagios?

- Monitoring
  - Things are okay
  - Operating as expected
  - Plugins perform “tests”
What Is Nagios?

- Monitoring
- Alerting
What Is Nagios?

- Monitoring
- Alerting
- Graphing
What Is Nagios?

- Monitoring
- Alerting
- Graphing
- Reporting

### Host Data

<table>
<thead>
<tr>
<th>Host</th>
<th>Up</th>
<th>Down</th>
<th>Unreachable</th>
</tr>
</thead>
<tbody>
<tr>
<td>secure.nagios.com</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>smtp.fusemail.net</td>
<td>0%</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td><a href="http://www.nagios.com">www.nagios.com</a></td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>66.67%</td>
<td>33.33%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

### Service Data

<table>
<thead>
<tr>
<th>Host</th>
<th>DNS IP Match</th>
<th>DNS Resolution</th>
<th>HTTP</th>
<th>Ping</th>
<th>SSL Certificate</th>
<th>Web Page Content</th>
<th>SMTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>secure.nagios.com</td>
<td>100%</td>
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<td>100%</td>
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<td>0%</td>
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<td>100%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>72.72%</td>
<td>9.09%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>10.02%</td>
</tr>
</tbody>
</table>
Business Case For Monitoring

- Reduce Downtime
- Plan For Upgrades
- Save Your Image
- Save Time
- Save Money
Nagios Users
What Can Be Monitored?
Computer Systems

- Servers
- Workstations
- Operating Systems
- Disk, Memory, CPU
- Services
- Processes
- Applications
- Performance Metrics
Network Infrastructure

- Routers
- Switches
- Firewalls
- Availability
- Port Status
- Bandwidth
- Traps
Databases

- MSSQL
- MySQL
- DB2
- Oracle
- Table, Database Size
- SQL Queries
- Performance Metrics
Websites

- Websites
- Availability
- Load Time
- Response Codes
- Page Content
- Web Transactions
- SSL Certificates
- DNS Matches
Security

- Security Alerts
- Intrusion Detection
- Port Scans
- Website Defacement
- DNS Hijacking
- Log Monitoring
- Motion Sensors
Other Uses

- Environmental
- Energy
- Audio Silence
- Financial
- Weather Alerts
- Threat Levels
Limitless Monitoring Capabilities

- Most Anything
- Extensible Architecture
- Hundreds of Plugins
- Easy To Create Your Own

exchange.nagios.org
Application Monitoring
Windows Apps

- Agent or WMI
  - Application and Process State
  - Performance Metrics
  - Event Logs
- Powershell, WSH scripts
- AutoIT
Linux / Unix Apps

- Agent or SSH
  - Application and Process State
  - Performance Metrics
  - Logs
- Scripts or Binaries (Shell, Perl, Python, *)
Web Application Monitoring
What's Important?

- Available / Online
- Proper Operation
- Secured
- Infrastructure Impact
- Transactions
- User Experience
- Build / QA Tests
- Business Processes
Reachability

- Ping Times
- Packet Loss
- DNS Resolution
HTTP Response

- Response Code
- Response Time
- Page Size
Security

- DNS / IP Mismatches
- SSL Certificate Expiration
- Page Content
Infrastructure Impact

- System Metrics
- Database Metrics
- Bandwidth
Web Transactions

WebInject

Web Transaction
www.google.com

WebInject OK - All tests passed successfully in 0.43 seconds

Nagios®

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Feature: google.com
   It should be up
   And I should be able to search for things

Scenario: Searching for things
   When I go to "http://www.google.com/"
   And I fill in "q" with "nagios"
   And I press "Google Search"
   Then I should see "www.nagios.com"

# cucumber-nagios features/google.com/search.feature
Critical: 0, Warning: 0, 4 okay | value=4.0000;;;;
Other Options

- cURL
- Mechanize
- Selenium
- AutoIT
User Experience Monitoring

- Real World Experience
- Test From Multiple Locations
Monitoring QA / CI / Test Systems

- Hudson
- Jenkins
- Rundeck
Monitoring Business Processes

- The “Internet” and “E-Commerce” Systems
- Aggregated Status

![Nagios Monitoring Diagram]

Legend:
- **Up**
- **Critical**
- **Warning**

Example E-Commerce System Status:
- **Up**: www.cnn.com
  - HTTP OK HTTP/1.1 200 OK - 100508 bytes in 0.874 seconds
- **Up****: www.google.com
  - HTTP OK HTTP/1.0 200 OK - 12849 bytes in 0.572 seconds
- **Up****: www.yahoo.com
  - HTTP OK HTTP/1.0 200 OK - 220854 bytes in 1.291 seconds
- **Critical****: 192.168.1.92
  - IMAP
  - No route to host
- **Critical****: 192.168.1.92
  - POP
  - No route to host
- **Critical****: 192.168.1.92
  - SSH
  - No route to host
- **Critical****: 192.168.5.4
  - Ping
  - CRITICAL - 192.168.5.4: rta nan, lost 100%
- **Critical**
  - localhost
  - Current Load
  - CRITICAL - load average: 10.77, 12.49, 11.31
- **Ok**: localhost
  - Current Users
  - USERS OK - 0 users currently logged in
- **Ok**: localhost
  - HTTP
  - HTTP OK HTTP/1.1 200 OK - 481 bytes in 0.088 seconds
Monitoring Tips
Implementation Tips

- Start With The Basics
- Determine What's Important, What's Not
- Make Adjustments, Additions Slowly
- Understand Your Audience
Nagios.com → Commercial Product
Nagios.org → Free Project
Exchange.nagios.org → Plugins, Addons
Support.nagios.com → Support