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Etaliq @ RTAC09

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Agenda

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Why Automation?

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Why Automation?

Everyone needs to...

Automation must...

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Why Automation?

Everyone needs to...

- Save time

Automation must...

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Why Automation?

Everyone needs to...

- Save time
- Increase quality

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Everyone needs to...

- Save time
- Increase quality
- Find *bugs* sooner

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- Save time
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- Find *bugs* sooner

Automation must...

- Reduce effort

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Why Automation?

Everyone needs to...

- Save time
- Increase quality
- Find *bugs* sooner

Automation must...

- Reduce effort
- Be *reliable*

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Why Automation?

Everyone needs to...

- Save time
- Increase quality
- Find *bugs* sooner

Automation must...

- Reduce effort
- Be *reliable*
- Be *fast*

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Why Automation?

Everyone needs to...

- Save time
- Increase quality
- Find *bugs* sooner

Automation must...

- Reduce effort
- Be *reliable*
- Be *fast*
- Be *easy*

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Automation Today

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Automation Environment

Manual DevTest Engineer

- Test strategies/plans
- On-demand scripting

Automation Engineer

- Translate test case to code
- Execute and review
- First-line problem determination

Manual DevTest

- Subject Matter Expert (SME)
- Defines how to test
- Defines what to test
- Creates *personal*...
  - automation as required
  - Tcl regular expressions

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Automation Environment

Manual DevTest Engineer

- Test strategies/plans
- On-demand scripting

Automation Engineer

- Translate test case to code
- Execute and review
- First-line problem determination

Automation Engineer

- *Not* SME
- Translates *verbage* test plan to running code
- Creates log output
- Reviews log output
- Determines if...
  - *environmental* error or
  - *real* problem

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Automation Environment Infrastructure

Many files:

- libraries, scripts, job files,
- node definitions, map files,
- log files, environment settings

Many systems:

- code libraries, device control,
- TGEN libraries, analysis,
- logging, reporting, revision control,
- reservation, scheduling, ...

Expertise required

- Unix, Tcl, regular expressions,
- basic DUT behavior,
- many file formats,
- TGEN functions,
- libraries,
- log interpretation

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Etaliq – Easy Test Automation

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ETA – Primary ROI Methods

Features:

- Test plan & case scripting
  - 25 instructions, coding time
- Resource usage
  - Syntax check
  - Simulated nodes
  - Hierarchy: Groups that FAIL don't run tests
- Log review & results reporting
  - Fully integrated indexed logs
  - Customizable summarized results reporting

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ETA – Automation Environment Infrastructure

Files:

- node table,
- execution table,
- test plan

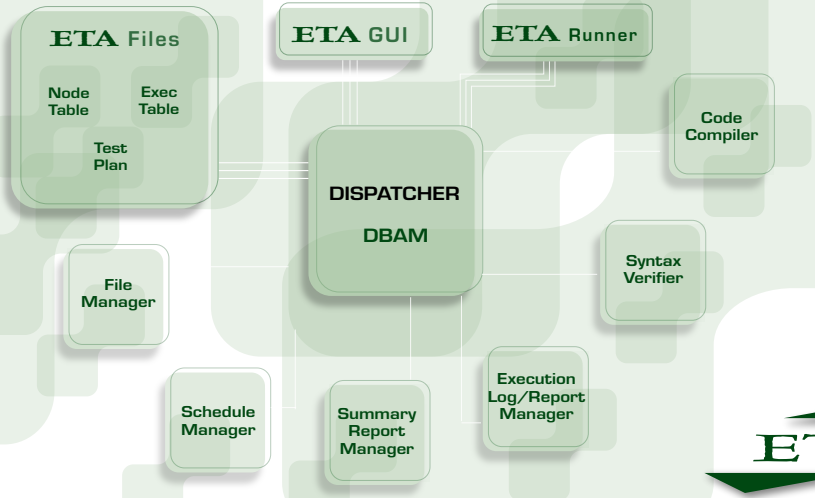
Single system:

- Execution Engine, TGEN types,
- log reports, summarized reporting,
- File Manager,
- Scheduler

Expertise required

- basic DUT behavior,
- minimal file formats,
- TGEN functions

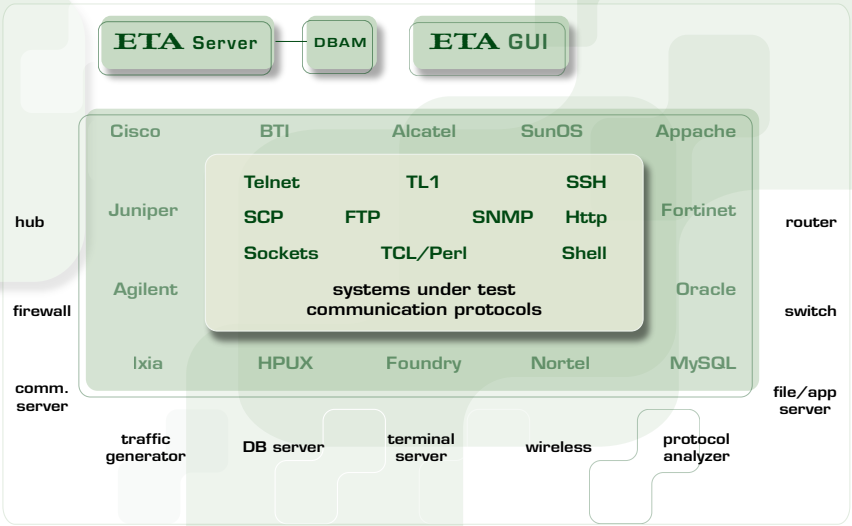
|system achitecture|



ETA 2.1

|target environment|

ETA 2.1



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ETA vs Tcl

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Send, Receive, and Verify!

- The ETA test plan template includes all related documentation.
- The **SEND** verb allows sending commands to nodes and handles all communications.
- The **RESULTLIST** verb defines expected results, no need for complicated parsing!
- **RESULTLIST** variables are associated with **SEND** instances and automate verification.
- Values are easily extracted from node output simply by referencing the **SEND** verb, no need for complicated parsing!
- The **EXPR** sub-verb provides powerful access to Boolean expressions and arithmetics, including seamless IP expressions.

ETA

```
Test Case Identifier: etaVsTcl_1
Title: ETA vs Tcl Comparison
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Common:
    RESULTLIST(CheckIntfUp)
        "line protocol = up"
        "input errors = 0"
        "AFTER 5 minute input rate  ATTR packets/sec > 0"
    RESULTLIST(CheckPingSuccess)
        "Success rate = 100 percent"
Setup:
Steps:
    # Show and check the local interface and statistics
    SEND RouterNode1 "show int Serial0" dispIntf CheckIntfUp

    # Derive remote IP based on local IP found in "dispIntf"
    # (p2p, ^.3 does .1 <-> .2)
    SET SrcIPnet dispIntf(Internet address)
    SET DestIP   EXPR(ipHost(SrcIPnet ^ 0.0.0.3))

    # Ping the remote interface
    SEND RouterNode1 "ping DestIP" CheckPingSuccess
Cleanup:
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Tcl (1/3)

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set intf $::nodes_array($RouterNode1,INTF1)

if { ![node_connect $RouterNode1] } {
    error "Cannot continue: Connection to node $RouterNode1 failed!"
}

set cmd "show int $intf"
if { ![node_send_receive $RouterNode1 $cmd\r "# *$" dispIntf] } {
    error "Cannot continue: Failed to send '$cmd' to node $RouterNode1!"
}

if { ![regexp "line protocol is (\[^ \]+)" $dispIntf - valLineProto] } {
    log_failure "line protocol value not found in '$cmd' output!"
    set ::test_result Fail
    set valLineProto "unknown"
} elseif { $valLineProto != "up" } {
    log_failure "line protocol is '$valLineProto' but expected to be 'up'!"
    set ::test_result Fail
} else {
    log_info "line protocol is '$valLineProto', as expected."
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} else {
    log_info "input errors value is $valInputErrors, as expected."
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if { ![regexp "5 minute input rate\[^\n\]*\
      (\[0-9\]+) packets/sec" $dispIntf - valInputRate] } {
    log_failure "5 minute input rate value not found in '$cmd' output!"
    set ::test_result Fail
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} elseif { $valInputRate <= 0 } {
    log_failure "5 minute input rate value is $valInputRate but expected\
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    set bytes [split $valSrcIP .]
    set bytes [lreplace $bytes 3 3 [expr { [lindex $bytes 3] ^ 3 }]]
    set valDestIP [join $bytes .]

    set cmd "ping $valDestIP"
    if { ![node_send_receive $RouterNode1 $cmd\r "# *$" dispPing] } {
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6 verb commands!

Tcl

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set cmd "show int $intf"
if { ![node_send_receive $RouterNode1 $cmd\r "# "$" dispIntf] } {
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}

if { [regexp "Internet address is\
      (\[0-9\]+\.\[0-9\]+\.\[0-9\]+\.\[0-9\]+)" $dispIntf - valSrcIP] } {
    log_failure "Internet address value not found in '$cmd' output!"
    set ::test_result Fail
    set valSrcIP "unknown"
} else {
    set bytes [split $valSrcIP .]
    set bytes [lreplace $bytes 3 3 [expr { [lindex $bytes 3] ^ 3 }]]
    set valDestIP [join $bytes .]

    set cmd "ping $valDestIP"
    if { ![node_send_receive $RouterNode1 $cmd\r "# "$" dispPing] } {
        error "Cannot continue: Failed to send '$cmd' to node $RouterNode1!"
    }
    if { ![regexp "Success rate is 100 percent" $dispPing] } {
        log_failure "Ping failed!"
        set ::test_result Fail
    } else {
        log_info "Ping succeeded."
    }
}

log_info "test result: $::test_result"
```

60 lines!

Send, Receive, and Verify!

Products

Routers Switches Hubs Gateways *Firewalls* *Servers*
Workstations *Databases* Analyzers

UUT Protocols

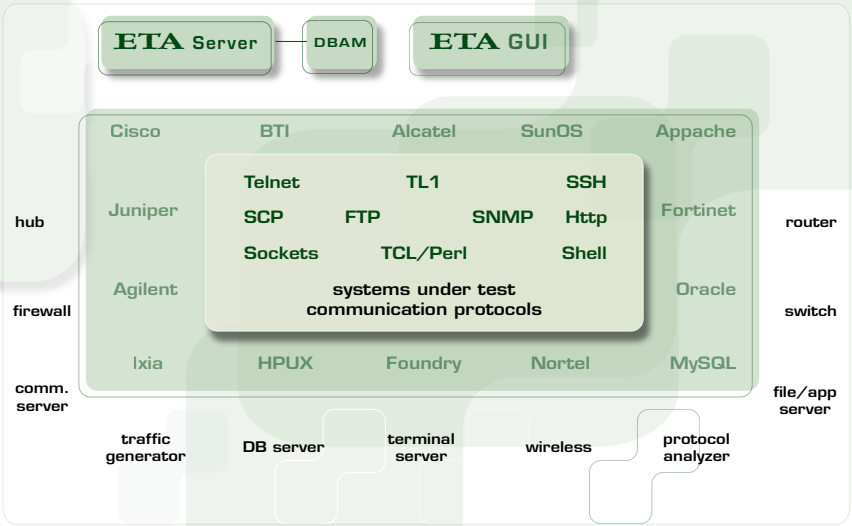
Telnet TL1 SSH SFTP FTP *SNMP* *XML* *Sockets* *SQL*
Tcl Perl Shell Files HTML *HTTP* *HTTPS*

Vendors

Cisco Juniper Nortel Alcatel Lucent F5 *IBM* Ciena MySQL
Apache Sun Linux *HP* Agilent Ixia Spirent *Microsoft*

|target environment|

ETA 2.1



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Task #1: Execution

Learn to:

- schedule an execution
- review an execution's reports
- navigate using relative position jumping
- update the test case code

Register at `http://www.etaliq.com` to access the *Live* ETA *Demo*

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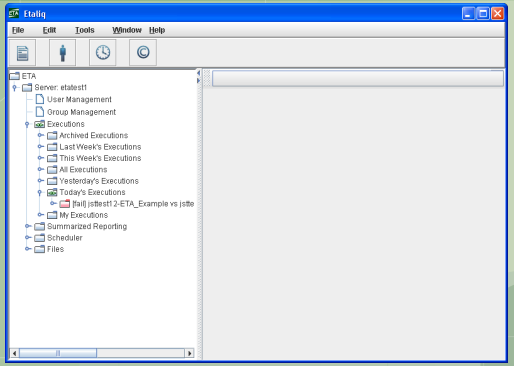
Task #1: Execution

List of executions



- Expand the *Executions* tree item to display execution filters

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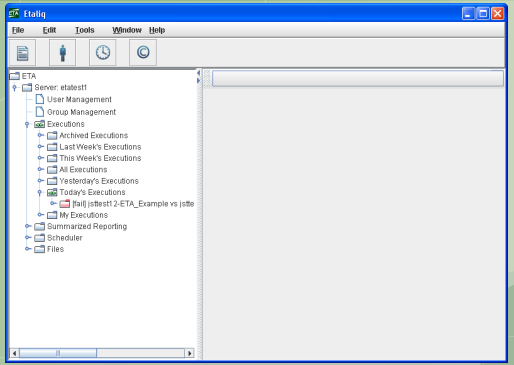
Task #1: Execution

List of executions



- Expand the *Executions* tree item to display execution filters
- Expand the *Today's Executions* execution filter

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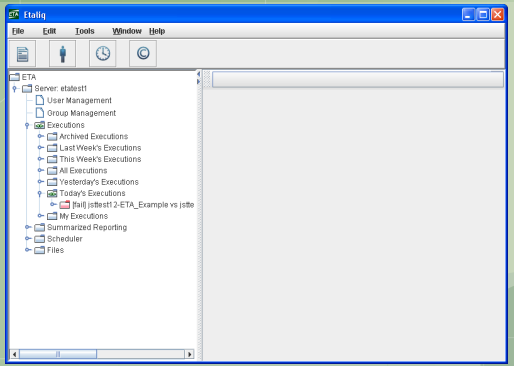
Task #1: Execution

List of executions



- Expand the *Executions* tree item to display execution filters
- Expand the *Today's Executions* execution filter
- Any executions just scheduled or executed today will appear under this tree item
- Several default execution filters are available
- Any number of custom execution filters can be created using the *Filter Management* tool

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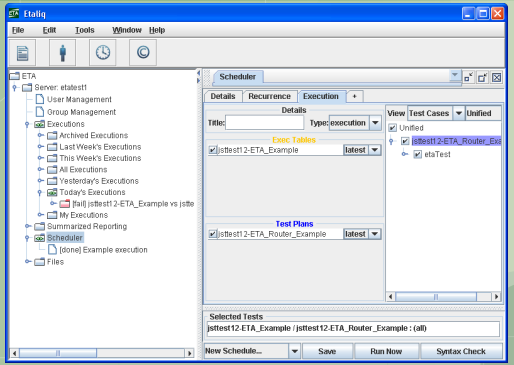
Task #1: Execution

Starting the Schedule



- Select the *Scheduler* link from the *Left Tree* to activate the *Scheduler* tool in the right pane

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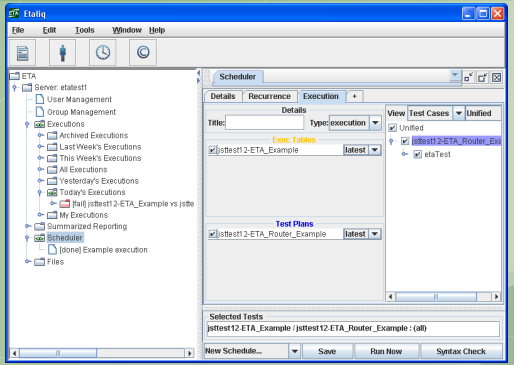
Task #1: Execution

Starting the Schedule



- Select the *Scheduler* link from the *Left Tree* to activate the *Scheduler* tool in the right pane
- Expand the *Scheduler* tree item to display existing schedules

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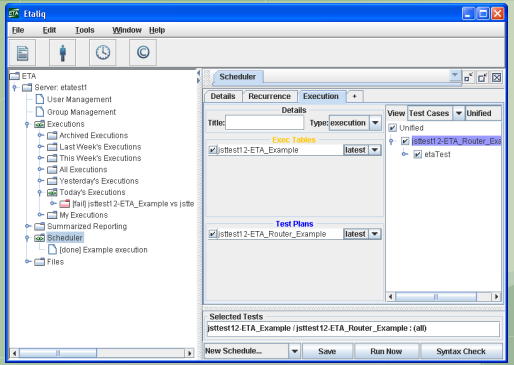
Task #1: Execution

Starting the Schedule



- Select the *Scheduler* link from the *Left Tree* to activate the *Scheduler* tool in the right pane
- Expand the *Scheduler* tree item to display existing schedules
- Select the *Scheduler*'s *Execution* tab

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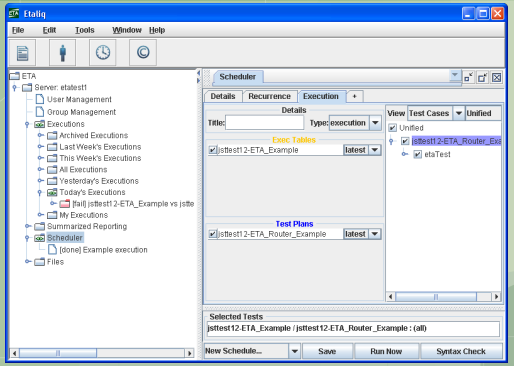
Task #1: Execution

Starting the Schedule



- Select the *Scheduler* link from the *Left Tree* to activate the *Scheduler* tool in the right pane
- Expand the *Scheduler* tree item to display existing schedules
- Select the *Scheduler*'s *Execution* tab
- Select the execution table named `user-ETA_Example`

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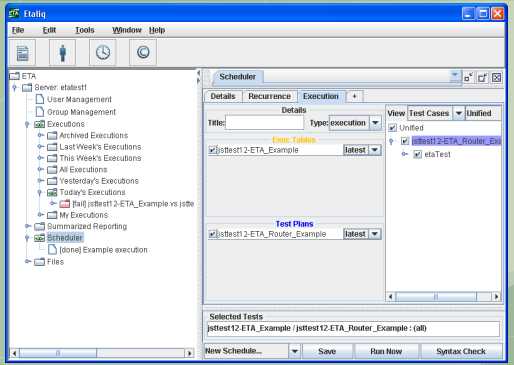
Task #1: Execution

Starting the Schedule



- Select the *Scheduler* link from the *Left Tree* to activate the *Scheduler* tool in the right pane
- Expand the *Scheduler* tree item to display existing schedules
- Select the *Scheduler*'s *Execution* tab
- Select the execution table named `user-ETA_Example`
- Select the test plan named `user-ETA_Router_Example`

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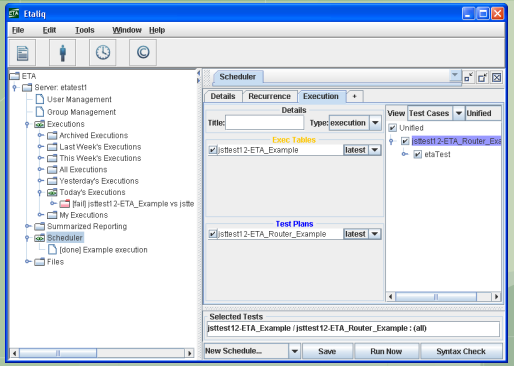
Task #1: Execution

Starting the Schedule



- Select the *Scheduler* link from the *Left Tree* to activate the *Scheduler* tool in the right pane
- Expand the *Scheduler* tree item to display existing schedules
- Select the *Scheduler*'s *Execution* tab
- Select the execution table named `user-ETA_Example`
- Select the test plan named `user-ETA_Router_Example`
- Click the *Run Now* button

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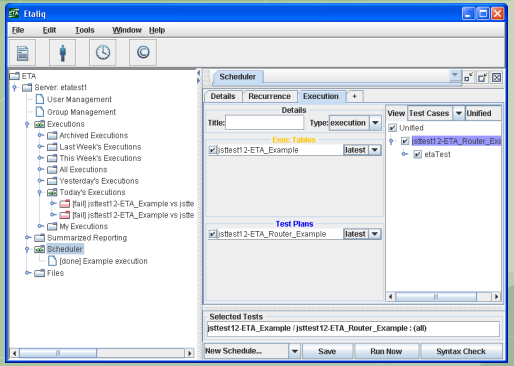
Task #1: Execution

Live Summary Report



- The schedule just started appears under *Today's Executions* in the *Left Tree*

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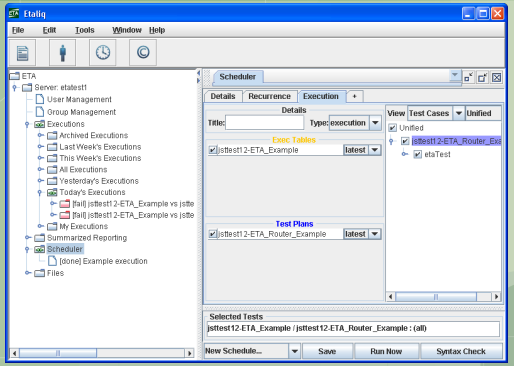
Task #1: Execution

Live Summary Report



- The schedule just started appears under *Today's Executions* in the *Left Tree*
- Expand the schedule to reveal any verification and test plan executions

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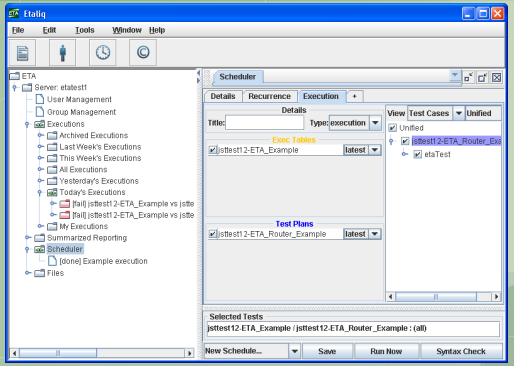
Task #1: Execution

Live Summary Report



- The schedule just started appears under *Today's Executions* in the *Left Tree*
- Expand the schedule to reveal any verification and test plan executions
- Select the execution to see the live reports in the right pane

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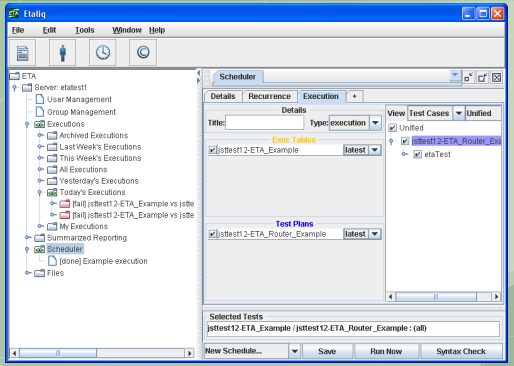
Task #1: Execution

Live Summary Report



- The schedule just started appears under *Today's Executions* in the *Left Tree*
- Expand the schedule to reveal any verification and test plan executions
- Select the execution to see the live reports in the right pane
- Click the *Right* arrow on the *Resize Bar* in the middle of the screen to hide the *Left Tree* and leave more room to the *View Panel*

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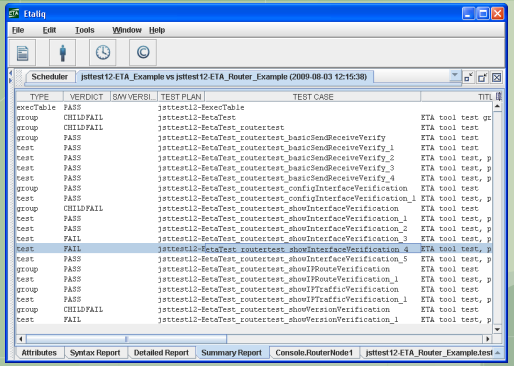
Task #1: Execution

Live Summary Report



- The default selected tab is the *Summary Report*
- This tab updates live to reflect the verdict of each executed group and test

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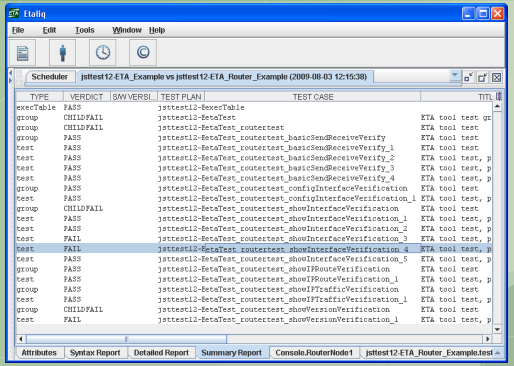
Task #1: Execution

Live Summary Report



- The default selected tab is the *Summary Report*
- This tab updates live to reflect the verdict of each executed group and test
- Select this test from the table:
  ETA_RouterTest_showInterfaceVerification_4

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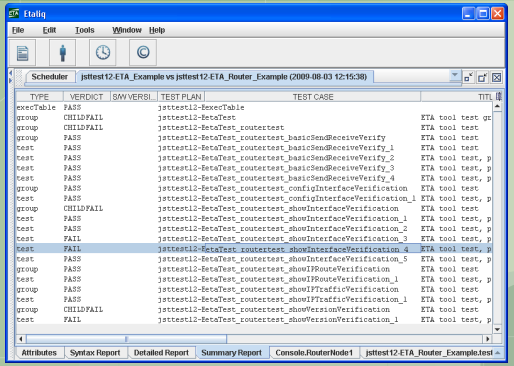
Task #1: Execution

Live Summary Report



- The default selected tab is the *Summary Report*
- This tab updates live to reflect the verdict of each executed group and test
- Select this test from the table:
  ETA_RouterTest_showInterfaceVerification_4
- Select the *Detailed Report* tab to jump directly to the details of its execution

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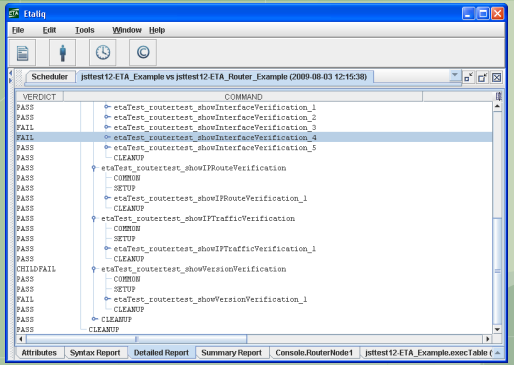
Task #1: Execution

Live Detailed Report



- The detailed report is a hierarchical representation of every test group, test case, section and step

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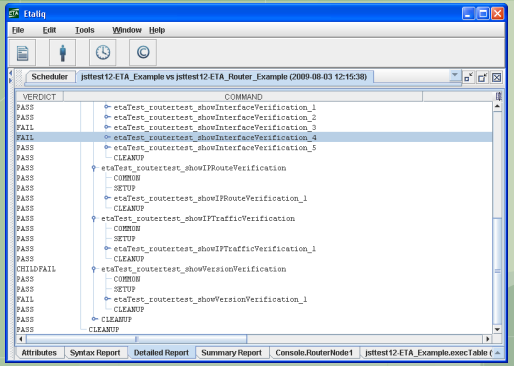
Task #1: Execution

Live Detailed Report



- The detailed report is a hierarchical representation of every test group, test case, section and step
- Every step executed is logged along with its verdict, details of execution and any node results

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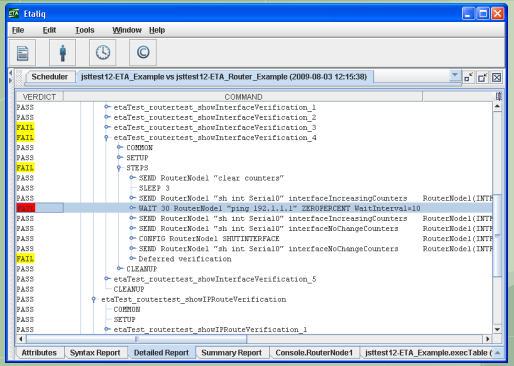
Task #1: Execution

Finding Failures



- Focus by selecting the currently highlighted line

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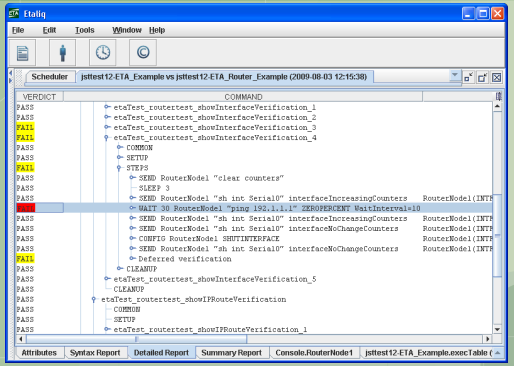
Task #1: Execution

Finding Failures



- Focus by selecting the currently highlighted line
- Press F4 to find the first failure

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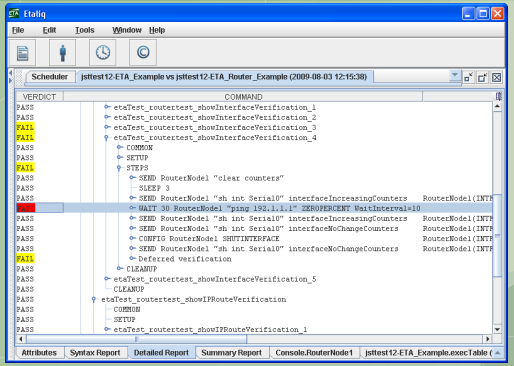
Task #1: Execution

Finding Failures



- Focus by selecting the currently highlighted line
- Press F4 to find the first failure
- Press F4 again to find the next failure

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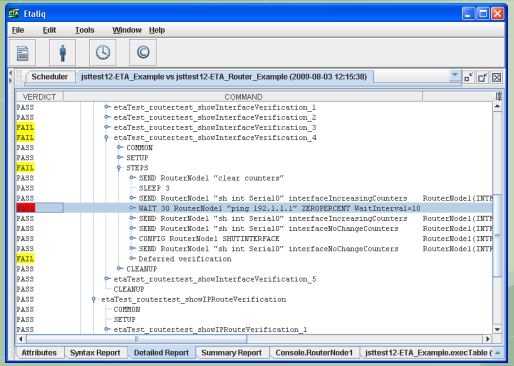
Task #1: Execution

Finding Failures



- Focus by selecting the currently highlighted line
- Press F4 to find the first failure
- Press F4 again to find the next failure
- Focus by selecting the currently highlighted line

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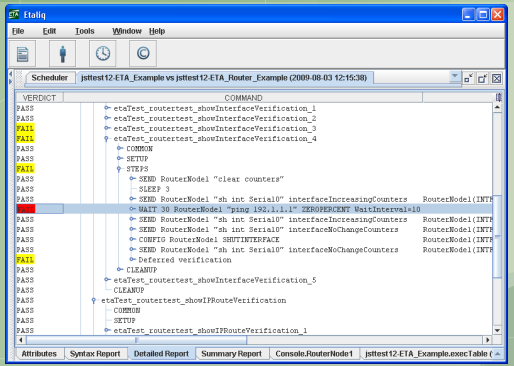
Task #1: Execution

Finding Failures



- Focus by selecting the currently highlighted line
- Press F4 to find the first failure
- Press F4 again to find the next failure
- Focus by selecting the currently highlighted line
- Select the *user-ETA_Router_Example.testPlan* tab to jump directly to the test case code (access hidden tabs using the *Tab Selector* arrow on the right side of the tab list)

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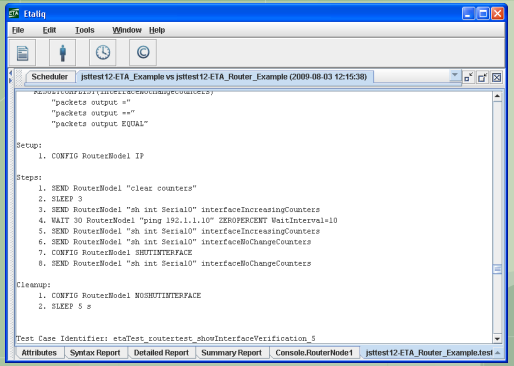
Task #1: Execution

Updating Test Code



- Select the *File* → *Unlock* menu item

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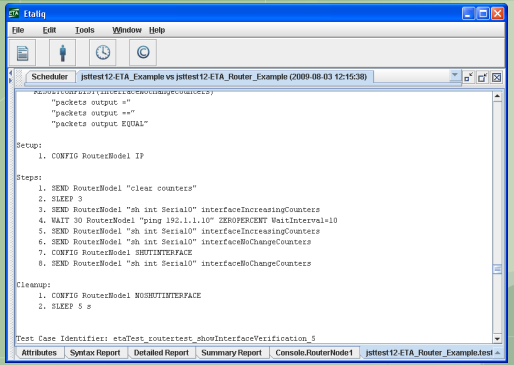
Task #1: Execution

Updating Test Code



- Select the *File* → *Unlock* menu item
- Update the test case code
  (For example, change the ping destination address from `192.168.1.1` to `192.168.1.10`)

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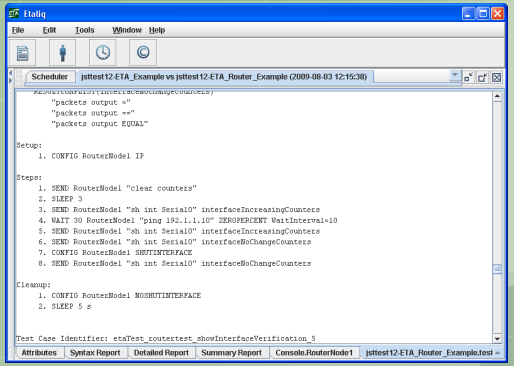
Task #1: Execution

Updating Test Code



- Select the *File* → *Unlock* menu item
- Update the test case code
  (For example, change the ping destination address from `192.168.1.1` to `192.168.1.10`)
- Select *File* → *Save* to save the changes
  (A “Success” dialog will pop-up to confirm the operation)

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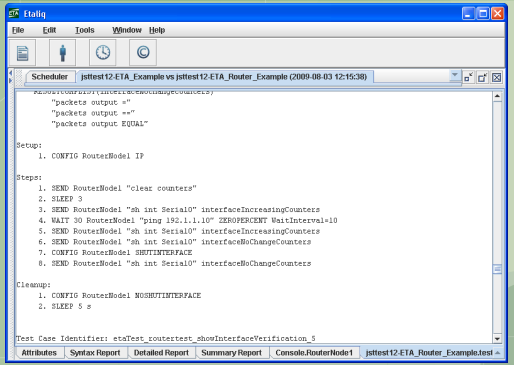
Task #1: Execution

Updating Test Code



- Select the *File* → *Unlock* menu item
- Update the test case code
  (For example, change the ping destination address from `192.168.1.1` to `192.168.1.10`)
- Select *File* → *Save* to save the changes
  (A “Success” dialog will pop-up to confirm the operation)
- Your test is ready to execute again.

It can’t get any easier than this!

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Task #2: Execution Summarization

Learn to:

- create a summarized execution report
- drill-down to access finer details
- access details of execution reports

Register at `http://www.etaliq.com` to access the *Live* ETA *Demo*

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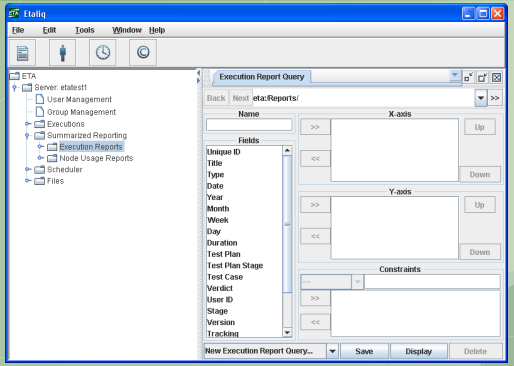
Task #2: Execution Summarization

Summarized Reporting



- Expand the *Summarized Reporting* tree item to display a list of report types

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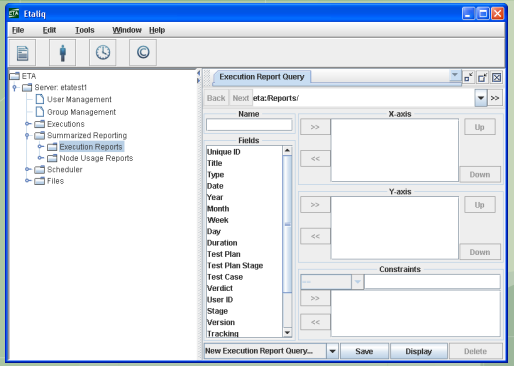
Task #2: Execution Summarization

Summarized Reporting



- Expand the *Summarized Reporting* tree item to display a list of report types
- *Execution Reports* rolls up the results of multiple executions to provide summarized *Execution Reports*

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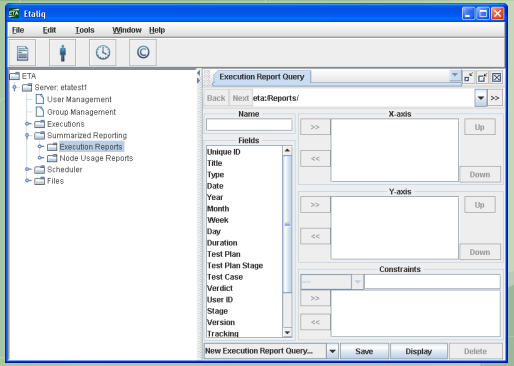
Task #2: Execution Summarization

Summarized Reporting



- Expand the *Summarized Reporting* tree item to display a list of report types
- *Execution Reports* rolls up the results of multiple executions to provide summarized *Execution Reports*
- *Node Usage Reports* tracks the usage of nodes by executions and manual lockouts to provide summarized *Node Usage Reports*

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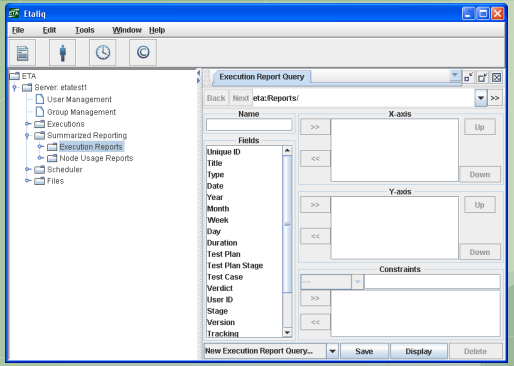
Task #2: Execution Summarization

Summarized Reporting



- Expand the *Summarized Reporting* tree item to display a list of report types
- *Execution Reports* rolls up the results of multiple executions to provide summarized *Execution Reports*
- *Node Usage Reports* tracks the usage of nodes by executions and manual lockouts to provide summarized *Node Usage Reports*
- Select the *Execution Reports* link to activate the *Execution Report Query*

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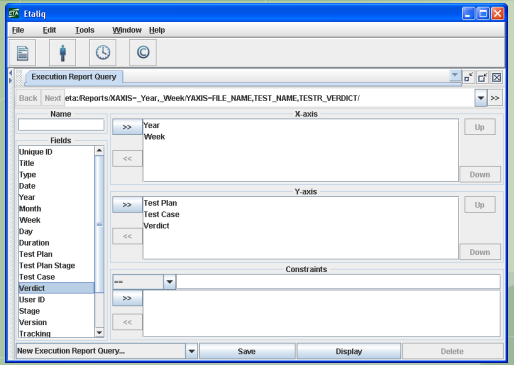
Task #2: Execution Summarization

Execution Report Query



- From this screen, many combinations of fields can be selected to appear on the X- or Y-axis of the report

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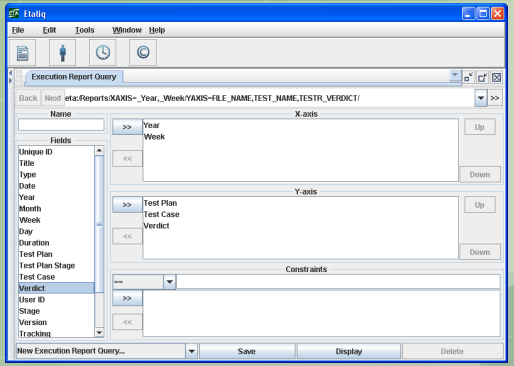
Task #2: Execution Summarization

Execution Report Query



- From this screen, many combinations of fields can be selected to appear on the X- or Y-axis of the report
- For each of *Year* and *Week*, select the field and press the top ">>" button to add it to the X-axis

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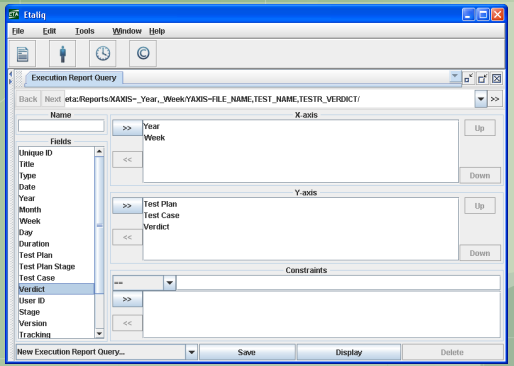
Task #2: Execution Summarization

Execution Report Query



- From this screen, many combinations of fields can be selected to appear on the X- or Y-axis of the report
- For each of *Year* and *Week*, select the field and press the top “>>” button to add it to the X-axis
- For each of *Test Plan*, *Test Case* and *Verdict*, select the field and press the middle “>>” button to add it to the Y-axis

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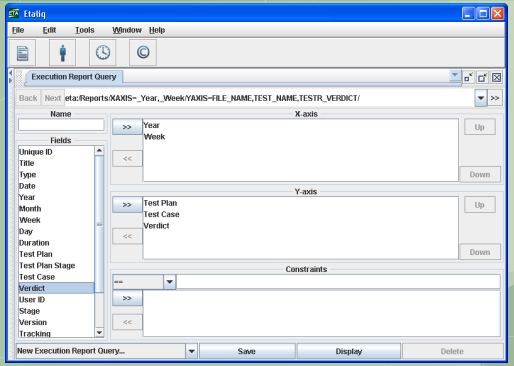
Task #2: Execution Summarization

Execution Report Query



- From this screen, many combinations of fields can be selected to appear on the X- or Y-axis of the report
- For each of *Year* and *Week*, select the field and press the top “>>” button to add it to the X-axis
- For each of *Test Plan*, *Test Case* and *Verdict*, select the field and press the middle “>>” button to add it to the Y-axis
- Press the *Display* button to create the report

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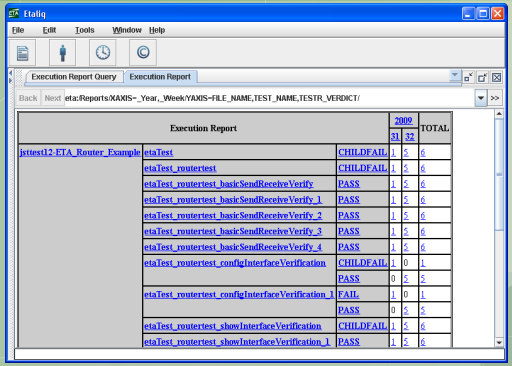
Task #2: Execution Summarization

Execution Report



Execution Report			2009		TOTAL
			31	32	
jrttest12-ETA_Router_Example	etaTest	CHILDFAIL	1	5	6
	etaTest_routertest	CHILDFAIL	1	5	6
	etaTest_routertest_basicSendReceiveVerify	PASS	1	5	6
	etaTest_routertest_basicSendReceiveVerify_1	PASS	1	5	6
	etaTest_routertest_basicSendReceiveVerify_2	PASS	1	5	6
	etaTest_routertest_basicSendReceiveVerify_3	PASS	1	5	6
	etaTest_routertest_basicSendReceiveVerify_4	PASS	1	5	6
	etaTest_routertest_configInterfaceVerification	CHILDFAIL	1	0	1
		PASS	0	5	5
	etaTest_routertest_configInterfaceVerification_1	FAIL	1	0	1
		PASS	0	5	5
	etaTest_routertest_showInterfaceVerification	CHILDFAIL	1	5	6
	etaTest_routertest_showInterfaceVerification_1	PASS	1	5	6

- Following any link will "drill-down" to the next level of report

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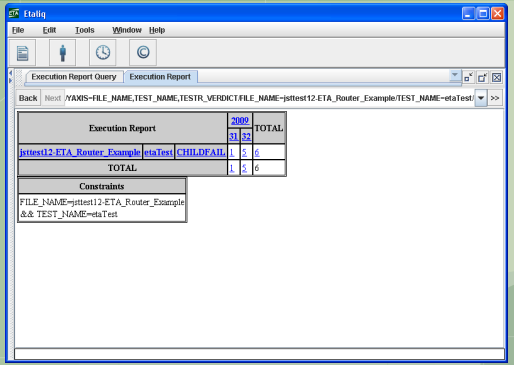
Task #2: Execution Summarization

Execution Report



- Following any link will “drill-down” to the next level of report
- When a header link is followed, the created report will only include that row or column

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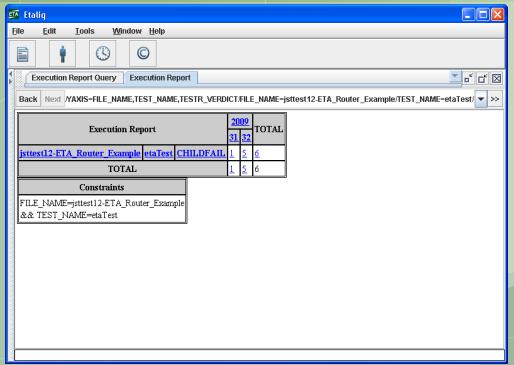
Task #2: Execution Summarization

Execution Report



- Following any link will “drill-down” to the next level of report
- When a header link is followed, the created report will only include that row or column
- When a cell link is followed, an Executions table will be displayed of all the executions that matched that cell

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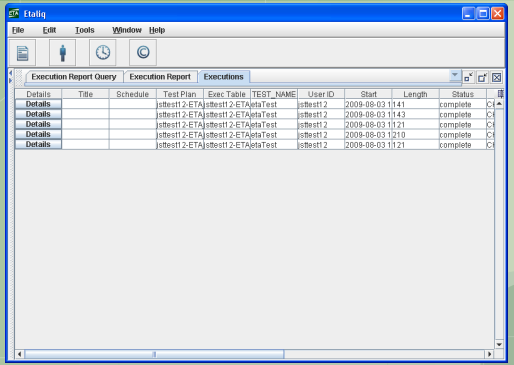
Task #2: Execution Summarization

Execution Table



- Within the Executions table, a *Details* button appears in the first column of every individual execution.

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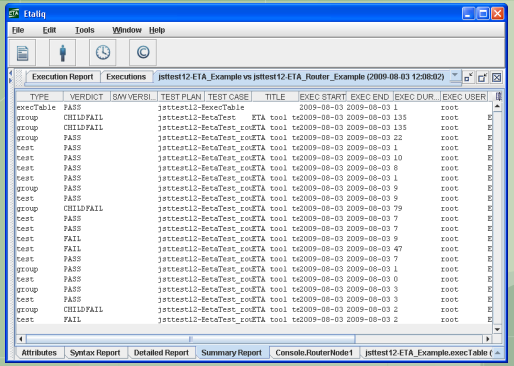
Task #2: Execution Summarization

Execution Table



- Within the Executions table, a *Details* button appears in the first column of every individual execution.
- Click one to open all the report files associated with that specific execution.

All information is just a click away!

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Case Studies

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Case Study #1

Test Automation: In-house Isn't the Answer

Who

- Telecom hardware start-up
- 50 engineers

Challenge

- Rapid black-box device testing
- Long term regression tests
- Broad coverage

Solution

- Old Linux server
- ETA Client and Server install
- A Student Engineer

Result

- Useful tests immediately
- 140 tests in less three months
- Protocol errors corrected
- Impressive customer feedback

Download the full text at `http://www.etaliq.com`

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Case Study #2

Test Automation: Do More Testing in Less Time

Who

- Carrier class network equipment provider
- Over 10,000 engineers

Challenge

- Configure DUT in preparation for manual testing
- Currently takes each engineer 2–6 weeks

Solution

- ETA Client and Server Install
- Develop a flexible table-based configuration suite

Result

- 6 person months meet 99% of requirements
- Provided 80 additional test cases to verify stability
- Became a licenced Etaliq ETA customer
- ROI well beyond expectations

Download the full text at `http://www.etaliq.com`

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Case Study #3

Test Automation: Do More Testing with Less Hardware

Who

- Carrier class network equipment provider
- Over 10,000 engineers

Challenge

- Determine current testbed configuration, and adapt test cases to suit
- Give summarized reports of result by combination

Solution

- ETA Client and Server Install
- 4 person months development time
- Developed a configuration reader
- Created 130 adaptable tests creating 2,200 unique results

Result

- Up to 2,500 results per day, per testbed
- ROI well beyond expectations

Download the full text at http://www.etaliq.com

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Case Study #4

Test Automation: Solve Problems Quickly

Who

- Carrier class network equipment provider
- Over 10,000 engineers

Challenge

- Place the DUT under heavy stress
- Allow other tests in parallel

Solution

- ETA Client and Server Install
- 6 person days development time

Result

- Solution delivered
- Fast, reliable, customizable
- ROI well beyond expectations

Download the full text at `http://www.etaliq.com`

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Conclusion

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Innovation in Automation

Etaliq revolutionizes and accelerates automated testing by providing an integrated framework where test plans and scripts are merged into a single document using **ETA**'s patent-pending command language.

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Manual & Automation Related Questions

What if you could

- Substantially reduce automation complexity?

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What if you could

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- Use automation to assist in manual testing?

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Manual & Automation Related Questions

What if you could

- Substantially reduce automation complexity?
- Use automation to assist in manual testing?
- Have your Subject Matter Experts (SMEs) write the automation?

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Manual & Automation Related Questions

What if you could

- Substantially reduce automation complexity?
- Use automation to assist in manual testing?
- Have your Subject Matter Experts (SMEs) write the automation?
- Create and verify your automation prior to feature availability?

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Manual & Automation Related Questions

What if you could

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- Use automation to assist in manual testing?
- Have your Subject Matter Experts (SMEs) write the automation?
- Create and verify your automation prior to feature availability?
- Get summary pass/fail reporting real time by day/week/month?

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Manual & Automation Related Questions

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- Create table-driven setups?

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Manual & Automation Related Questions

What if you could

- Substantially reduce automation complexity?
- Use automation to assist in manual testing?
- Have your Subject Matter Experts (SMEs) write the automation?
- Create and verify your automation prior to feature availability?
- Get summary pass/fail reporting real time by day/week/month?
- Create table-driven setups?
- Create your automation in $1/10^{th}$ the time?

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Conclusion

If the answer is *YES*.

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Conclusion

If the answer is *YES*.

We can help.

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Conclusion

If the answer is *YES*.

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Conclusion

If the answer is *YES*.

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