|  |  |
| --- | --- |
| Router 6000 19Q4 Engineering Guide |  |

**Abstract**

This BNEW NRO Engineering Guide contains recommendations on Configuration Management for Router 6000, and instructions on creating a script file using the Router Scripting Tool (RST).

It is intended to assist the SDU and local delivery in Network Rollout of a new Router 6000 in release 19Q4.

Contents

[1 Release History 3](#_Toc8651899)

[2 References 4](#_Toc8651900)

[3 Quick Start 6](#_Toc8651901)

[4 Introduction 8](#_Toc8651902)

[4.1 Router 6000 use cases 8](#_Toc8651903)

[4.2 Key Process Components 8](#_Toc8651904)

[4.3 Field Releases 8](#_Toc8651905)

[4.4 Changes History 9](#_Toc8651906)

[4.5 R6k Type 9](#_Toc8651907)

[4.6 Workflow 9](#_Toc8651908)

[4.7 CPI 10](#_Toc8651909)

[5 Parameter Guide 11](#_Toc8651910)

[5.1 Configuration files 11](#_Toc8651911)

[5.2 Abort and Commit 11](#_Toc8651912)

[5.3 Troubleshooting notes 12](#_Toc8651913)

[5.4 Parameter Recommendations 14](#_Toc8651914)

[6 Router Scripting Tool (RST) 20](#_Toc8651915)

[6.1 Delivery 20](#_Toc8651916)

[6.2 Features 20](#_Toc8651917)

[6.3 Installation 20](#_Toc8651918)

[6.4 Update and Rollback 21](#_Toc8651919)

[6.5 Working without a connection to Ericsson 21](#_Toc8651920)

[6.6 Limitations 22](#_Toc8651921)

[6.7 Steps to create a script file for one new Router 6000 24](#_Toc8651922)

[6.7.1 Overview of steps 24](#_Toc8651923)

[6.7.2 Details of steps 24](#_Toc8651924)

[6.8 RST Data Validation 34](#_Toc8651925)

[6.9 Other RST tasks 36](#_Toc8651926)

[6.9.1 Overview of tasks 36](#_Toc8651927)

[6.9.2 Details of tasks 36](#_Toc8651928)

[7 EDI Examples and References 49](#_Toc8651929)

[7.1 Examples 49](#_Toc8651930)

[7.2 References 49](#_Toc8651931)

[7.3 Profiles 49](#_Toc8651932)

[7.4 Example EDI’s from the Evolved IP Network (EIN) solution 50](#_Toc8651933)

[7.4.1 18Q2 50](#_Toc8651934)

[8 Compare two EDI’s 52](#_Toc8651935)

[8.1 Spreadsheet Compare 52](#_Toc8651936)

[8.2 Quick Compare 53](#_Toc8651937)

[9 Auditing a Configured Router 55](#_Toc8651938)

[9.1 Winmerge 55](#_Toc8651939)

[9.2 Unique File tool 58](#_Toc8651940)

[10 Auto-integration 60](#_Toc8651941)

[11 RST Support 61](#_Toc8651942)

[12 EDI Support 64](#_Toc8651943)

# Release History

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Version** | **Status** | **Date** | **Updates** | **Who** |
| PC1 | Preliminary | 2017-06-15 | Preliminary for 17B | R. Mark Anderson |
| PC2 | Preliminary | 2017-06-22 | Review final for 17B. Fix RST release in section “Field Releases”. Update References. | R. Mark Anderson |
| C3 | Final | 2017-07-12 | Updated EIN examples, EDI compare, Config file to EDI. | R. Mark Anderson |
| PD1 | Preliminary | 2017-07-30 | First Preliminary version for 18A. Router 6672 changed to Router 6000. | R. Mark Anderson |
| PD2 | Preliminary | 2017-08-21 | 6675, review feedback. | R. Mark Anderson |
| PD3 | Preliminary | 2017-09-21 | TG3 deliverable. | R. Mark Anderson |
| PD4 | Preliminary | 2017-10-23 | Updates from reviews. | R. Mark Anderson |
| PD5 | Preliminary | 2017-12-10 | TG4 candidate | R. Mark Anderson |
| PD6 | Preliminary | 2017-12-28 | Added EIN 17.Q4 examples, updated Config file to EDI. | R. Mark Anderson |
| PE1 | Preliminary | 2018-06-25 | Preliminary for 18Q2 | Raymond Cao |
| PE2 | Preliminary | 2018-08-14 | Update according to Patrik and Regena’s comments | Raymond Cao |
| PF1 | Preliminary | 2018-09-11 | Preliminary for 18Q3 | Raymond Cao |
| PG1 | Preliminary | 2018-12-18 | Preliminary for 18Q4 | Yiqun Li |
| PI1 | Preliminary | 2019-02-26 | Preliminary for 19Q1 | Yiqun Li |
| PJ1 | Preliminary | 2019-05-05 | Preliminary for 19Q2 | Yiqun Li |
| PK1 | Preliminary | 2019-08-15 | Preliminary for 19Q3 | Yiqun Li |
| PL1 | Preliminary | 2019-11-11 | Preliminary for 19Q4 | Yiqun Li |

# References

|  |  |
| --- | --- |
| **Document** | **Location** |
| 6274 19 Q1 GA Customer Documentation (CPI) | <http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN7120478/3R7B> |
| 6672 19 Q1 GA Customer Documentation (CPI) | <http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN7120478/1R7B> |
| 6675 19 Q1 GA Customer Documentation (CPI) | http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN7120478/2R7B |
| 6317 and 6471 19 Q1 GA Customer Documentation (CPI) | <http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN7120478/4R7B> |
| 6274 18 Q4 PRA Customer Documentation (CPI) | http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN 712 0478/3 R6A |
| 6672 18 Q4 PRA Customer Documentation (CPI) | http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN 712 0478/1 R6A |
| 6675 18 Q4 PRA Customer Documentation (CPI) | http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN 712 0478/2 R6A |
| 6317 and 6471 18 Q4 PRA Customer Documentation (CPI) | http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN 712 0478/4 R6A |
| 6274 18 Q3 GA Customer Documentation (CPI) | [http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN 712 0478/3 R5B](http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN%20712%200478/3%20R5B) |
| 6672 18 Q3 GA Customer Documentation (CPI) | [http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN 712 0478/1 R5B](http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN%20712%200478/1%20R5B) |
| 6675 18 Q3 GA Customer Documentation (CPI) | [http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN 712 0478/2 R5B](http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN%20712%200478/2%20R5B) |
| 6317 and 6471 18 Q3 GA Customer Documentation (CPI) | [http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN 712 0478/4 R5B](http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN%20712%200478/4%20R5B) |
| Router 6274 18Q2 GA Customer Documentation (CPI) | [http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN 712 0478/3 R1B](http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN%20712%200478/3%20R1B) |
| Router 6371 and 6471 18 Q2 GA Customer Documentation (CPI) | [http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN 712 0478/4 R3B](http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN%20712%200478/4%20R3B) |
| Router [6672 18 Q2 GA Customer Documentation (CPI)](javascript:parent.vL(14281,1)) | [http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN 712 0478/1 R4B](http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN%20712%200478/1%20R4B) |
| Router [6675 18 Q2 GA Customer Documentation (CPI)](javascript:parent.vL(17281,1)) | [http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN 712 0478/2 R3B](http://cpistore.internal.ericsson.com/alexserv?li=EN/LZN%20712%200478/2%20R3B) |
| Router 6672 19Q4 Customer Documentation (CPI) | http://cpistore.internal.ericsson.com/alexserv?ID=15177&DB=60525-en\_lzn7120478\_1\_r3b.alx&FN=alexdoc.html |
| Router 6675 19Q4 Customer Documentation (CPI) | http://cpistore.internal.ericsson.com/alexserv?ID=18177&DB=60526-en\_lzn7120478\_2\_r2b.alx&FN=alexdoc.html |
| Router 6371 and 6471 19Q4 Customer Documentation (CPI) | http://calstore.internal.ericsson.com/alexserv?ID=23086&DB=199855-en\_lzn7120476\_4\_r1a.alx&FN=alexdoc.html |
| Router 6000 19Q4 EDI | <https://nrocms-staging.ericsson.net/main/engineering-docs/router-6000-edi-369.aspx> |
| Router 6000 19Q4 EDI | [https://nrocms.ericsson.net/Main/Products-Services.aspx?manualId=5fd81845-1dcc-476c-825d-f18411e7f3cf](https://prscms.ericsson.net/Main/Products-Services.aspx?manualId=5fd81845-1dcc-476c-825d-f18411e7f3cf) |
| Router 6672 19Q4 EDI | [https://nrocms.ericsson.net/Main/Products-Services.aspx?manualId=30026e86-fd38-4f36-a651-ba5b693324d6](https://prscms.ericsson.net/Main/Products-Services.aspx?manualId=30026e86-fd38-4f36-a651-ba5b693324d6) |
| Router 6000 Engineering Guide | [https://nrocms.ericsson.net/Main/Products-Services.aspx?manualId=ed28a319-39b9-4cc9-9ed3-d8c4f692aafd](https://prscms.ericsson.net/Main/Products-Services.aspx?manualId=ed28a319-39b9-4cc9-9ed3-d8c4f692aafd) |
| Ericsson RST Tool | <http://10.221.64.240:8080/RSTDeploy/Default.htm> |
| Router 6000 Commissioning | TBD |
| EIN 18Q1 Technical Library | <http://calstore.internal.ericsson.com/elex?id=10140> |
| EIN 18.Q2 Technical Library | <http://calstore.internal.ericsson.com/elex?id=2204> |

# Quick Start

1. Install RST. RST will start at the end of the installation.

<http://10.221.64.240:8080/RSTDeploy/Default.htm>

1. Download the latest Router 6000 EDI template. See References.
2. Create a project in RST.

RST – File – New

1. Complete the EDI using the examples as a guide. Examples are on the hidden worksheets. Also, you can generate a filled EDI from a configuration file.

RST – File – Import – Convert(Script to EDI)

For more details about Converting function, please see [6.9.6](#mark6_9_6)

1. Import the EDI. An EDI importing:

RST – File - Import – Import EDI – Normal EDI

And the EDI batch generating

RST – File - Import – Import EDI – EDI Batch Processing.

For more details about EDI Batch Processing, please see [6.9.](#mark6_9_7)8

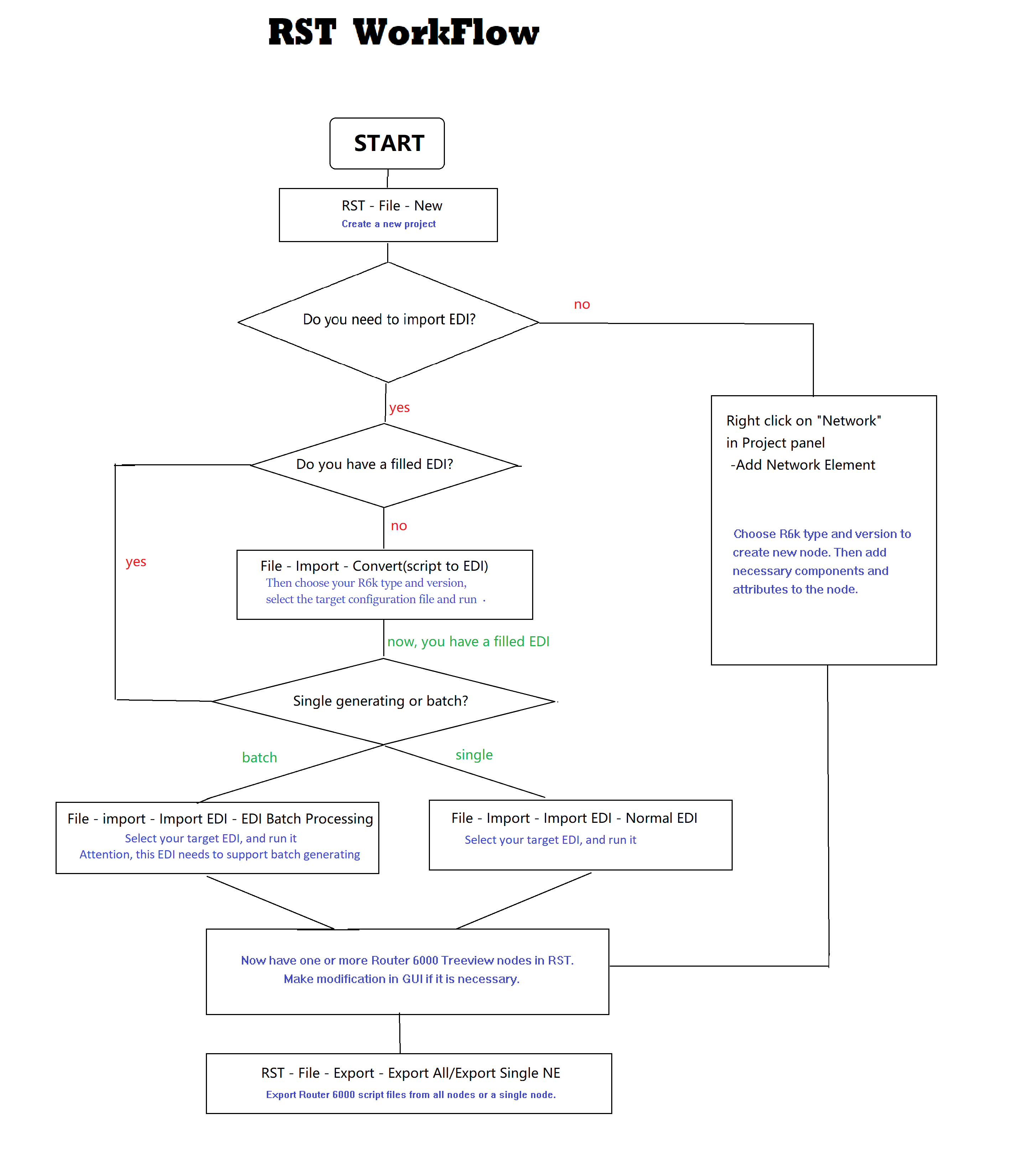
1. Or create new node in RST

Right click on “Network” in Project panel – Add Network Element

1. Draw scripts into RST for importing, please see [6.9.](#mark6_9_7)7
2. Generate the script.

RST – File – Export – Export All

See Work Flow graph bellowing:



# Introduction

This Engineering Guide describes the workflow to configure and integrate the Router 6000. The workflow is part of BNEW (Business Network Engineering Services) NRO (Network Roll-Out). This document applies to Release 19Q4. Router 6000 products supported are 6672, 6675, 6371, 6471/1, 6471/2, TDM 1001, and 6274.

The Router 6000 combines multiple functions into a single platform that provides Layer 3 (IP) routing and Layer 2 (Ethernet) network aggregation. The router provides carrier-class reliability, scalability, performance, and an optimal power footprint. It was introduced as a new product in release 16A, and in general replaces the Ericsson MINI-LINK SP router and SIU/TCU.

## Router 6000 use cases

There are two major field scenarios (use cases) for Router 6000.

1. Delivery of a new RAN site with Router 6000.
2. Delivery of stand-alone Router 6000 as a cell site router to be integrated with either an Ericsson RAN or another vendor’s RAN

## Key Process Components

There are two key components to the engineering process: the EDI and the RST tool.

1. EDI: The Engineering Data Input spreadsheet is used to collect information from customers in order to configure one new Ericsson Router 6000.

The EDI is then used as an input to the Router Scripting Tool (RST). RST exports a script file (or configuration file) that is used to configure one new Ericsson Router 6000.

The EDI is a hand-off between engineering and integration.

1. RST: The Router Scripting Tool is an offline, PC-based tool which imports an EDI and exports a Router 6000 script file.

## Field Releases

There is a different EDI template for each field release: 18Q3, 18Q4 and 19Q1. So, for example, if your router is using field release 18Q4, ensure you are using the (latest) EDI template for 19Q4.

RST support begins with 18q3. So currently, RST can import a 18Q3 EDI, 18Q4 EDI, 19Q1 EDI, 19Q2 EDI, 19Q3 EDI or 19Q4 EDI.

The 19Q4version of RST is named 19.04.XX. It supports three independent release streams this way.

1. 19Q4 EDI -> RST 19Q4 -> 19Q4 script file.
2. 19Q3 EDI -> RST 19Q3 -> 19Q3 script file.
3. 19Q2 EDI -> RST 19Q2 -> 19Q2 script file.

The 18Q4, 19Q1 and 19Q2 EDI are different documents that are not compatible with each other. Similarly, the 18Q4 script file, 19Q1 script file, and 19Q2 script file are not compatible with each other. RST looks for a release field in the EDI to decide which release the EDI is, and generates the script of the same release. RST can not generate a 18Q4 script file from a 19Q1 EDI, or vice versa.

## Changes History

The EDI and RST focus on the Configuration Management task for the Router 6000 product.

Before 18A, only one router type was supported by default, Router 6672.

In 18A, five router types were added: Routers 6672 & 6675, 6371, 6471/1, 6471/2, TDM 1001.

In 18Q2, one more router type was added: Router 6274.

## R6k Type

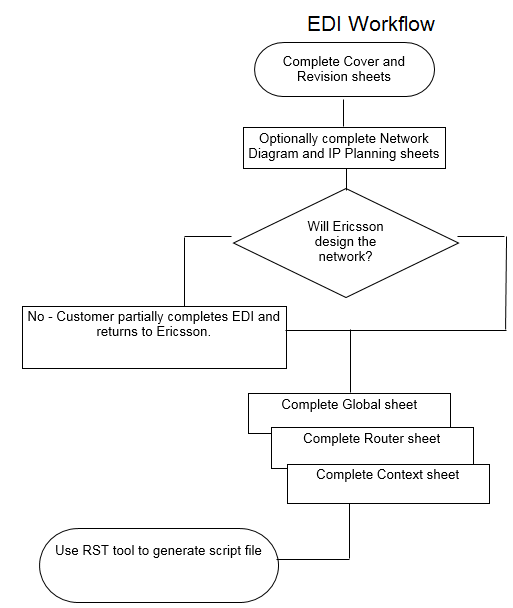
Field “R6k Type” in the EDI table “Software Baseline” determines the Router 6000 product: 6672, 6675, 6371, 6274, 6471/1, 6471/2.

To guide users on which EDI tables that can be completed for R6k Type:

* 6672 and 6675 - Fields are shaded light grey.
* 6672 only - Fields are shaded orange.
* 6672, 6675, 6x71 not 6274 - Fields are dark blue.

## Workflow

The Engineering workflow for Router 6000 Configuration Management is illustrated in the diagram below. Worksheets in the EDI may be completed by Ericsson or the customer or both. In 18A, 8 context sheets are changed to a single context sheet.



## CPI

The CPI describes the overall Commissioning process used for a Router 6000.

Configuration tasks are divided between “Initial System Configuration” as outlined in the CPI, and the configuration script. RST will perform the configuration afterwards and assumes the Initial part is done.

# Parameter Guide

In this document “configuration” refers to Configuration Management, meaning using CLI commands to set and create parameters on Router 6000.

## Configuration files

Router 6000 can be configured several ways.

1. Entering CLI commands manually. See CPI “Use the CLI”.
2. Running a “script file” by copy/pasting it into the CLI. A “script file” is called a “configuration file” in the CPI. In this document, it will be called a “script” or “script file”. The CPI states that you can “create and modify a configuration file offline by entering configuration commands using any text editor.”
3. Loading a script file using the “configure url” command. The script is transferred first to the router file system using FTP or USB. The “configure url” command provides a file path to the script and executes it. Such a file is called a “configuration file” in this document. A “configuration file” is usually identical to a “script file”. See next section.
4. Running a script file using the Smart Laptop tool. See [References](#_References).

These are the syntax differences of a configuration file compared to a script file.

1. The “configure” and “end” commands are optional in a configuration file. The configuration file is executed in global configuration mode, so a “configure” or “end” command in the configuration file is ignored.
2. You cannot “exit” out of configuration mode in a configuration file and enter back in with another “configure” command. This will abort the execution.
3. You cannot execute “exec” commands like “clock set” in a configuration file. The commands must all be in configuration mode.
4. You can perform multiple “commit” commands in a configuration file as you would in a script file. This is helpful because if the configuration is changed for some resources like ptp-clock, a commit is sometimes needed immediately.

## Abort and Commit

Commands entered in any configuration mode do not immediately change the working configuration of the router. After running a script file or entering commands manually, a “commit” command is required to apply the transactions to the working configuration. By contrast, when using “configure url”, the commit will be performed as part of the command.

If you are using copy/paste to run the script, you can delete your transactions by entering “abort” instead of “commit”.

You can validate your transactions with “validate” before “abort” or “commit”.

Entering an “exit” command while in global configuration mode will not perform a commit. The commands you have previously entered remain pending until you re-enter global configuration mode and commit them. If the CLI session is terminated however, the changes may be committed.

Similarly, it has been observed that some system and banner commands are committed automatically and cannot be aborted.

## Troubleshooting notes

This section contains notes on commands that are useful when troubleshooting a script file.

**Privilege**

Run the script as an administrator with the maximum privilege level of 15. The script may configure new administrator accounts. It will fail if it is run at a too low privilege level.

privilege level 15

**Terminal size**

Before running a script, increase the terminal size in exec mode to eliminate nuisance paginations and line wraps in the CLI session.

terminal length 0

terminal width 132

**Session timeout due to inactivity**

It is recommended to increase the session timeout to eliminate nuisance logoffs. The default value is 3 minutes. This example increases it so it never logs off.

configure

no timeout session idle

**Extended ASCII characters**

The CLI does not accept Extended ASCII characters such as “double quotation mark”. You must use enter Basic ASCII characters such as "double quotes".

Similarly, the CLI does not accept em-dash (—) or en-dash (–) characters. You must use plain hyphen (-) characters. Example:

Good: system clock timezone AST –4

Bad: system clock timezone AST —4

**Database lock contention**

This is an error message you might receive while running a script that stops its execution. Often this is caused by contention with another user who is logged in. To address the condition:

* abort the script execution
* abort configuration command mode
* show users (to see the administrators who are logged in)
* clear administrator *admin-name* (clear them all, one by one)
* run the script again
* or reload the router

**Show release**

Use this command to determine the field release. It is more useful than the command *show software.* The digits R4G in the Product Number below indicate the field release. R1=16A. R2=17A, R3=17B, R4=18A, R5=18Q2, R6=18Q3 and R7=18Q4.

[local]DUT3#show release

Installed releases:

Version SPR2-CXP9027695\_1-R4G04\_9617-Release

Built on Thu Dec 7 04:33:00 CET 2017

Copyright (C) 1998-2018, Ericsson AB. All rights reserved.

**Transferring a script file to the router**

It is recommended to use SFTP/FTP/USB to transfer files from your PC to the router. This is described in the CPI “Manage Files”, Operating Instructions 49/1543-AXI 101 09/3 Uen A. However, if you are using FTP, the transfer will fail if the default router parameter values are present. Use the *show service* command to see the current router values. The SFTP server shown below is disabled.

[local]DUT3#show service

…

Protocol Services:

Protocol Client Server

-------------------------------------------------------

ftp Disabled Not Supported

tftp Disabled Not Supported

ssh Enabled Enabled

sftp Disabled Disabled

scp Disabled Disabled

telnet Enabled Enabled

Enable the sftp server. Then transfer the script file from your PC.

[local]DUT3#conf

[local]DUT3(config)#context local

[local]DUT3(config-ctx)#service sftp

[local]DUT3(config-ctx)#commit

**Running the script file**

When transferring a script file using sftp, the working directory on the router will be /flash/home/<user>. The example below shows the working directory for user “bugs”.

[local]DUT3#cd /flash/home/bugs

Current directory is now /flash/home/bugs

To debug a script file, it is recommended to use the verbose option. This will display the execution of each command line and stop on failure.

config <filename> verbose

When using the verbose option, the execution of each command line in the script is numbered. To find the associated line number in your script file, use an editor on your PC that can display line numbers such as textpad.

<https://www.textpad.com/>

**Prompts that stop script execution**

Some commands will stop the script execution and wait for a prompt. To avoid being prompted when adding or deleting a context in a script file use:

no system confirmations context

The EDI field “confirmations context” controls the appearance of this command in the script.

**Excessive events**

Running the script on the console port or with the command *terminal monitor* enabled can cause excessive events to be displayed and will obscure the execution of the script. It is recommended to run the script on the LMT port with *no terminal monitor*.

**Saving the EDI**

If the RST tool is open and you have imported an EDI, do not modify the EDI until you have closed the RST project. RST tries to lock the EDI spreadsheet file when it is working on it.

## Parameter Recommendations

This section contains Parameter Recommendations for Router 6000 in release 18Q4. Most Configuration Management information can be found in CPI. However, during lab testing, some CPI and CLI defects were observed during configuration and these were shared with Design. Some of these defects remain unresolved or are not clearly documented, and these are summarized in the table below.

**R6k Type**

This is a new field since release 18A. It is mandatory. The range is: 6672, 6675, 6371, 6471/1, 6471/2, 6274.

**RST Model Version**

This field is mandatory and should not be changed. The range is: R6K18Q2, R6K18Q3, R6K18Q4.

**EDI: Deleted and added fields**

RST verifies that it finds all the fields (for the current RST version) when it imports an EDI. If any fields are deleted in the EDI, RST will generate a warning on import. If any new fields are added to the EDI, RST will ignore them.

**EDI: SNMP tables**

For fields “snmp target”, “snmp group”, “snmp user”, “snmp target-parameters”, and “snmp notify-target”, RST requires the parameters be entered in the exact order specified in the command syntax, as shown in the Reference sheet.

**RMON and SNMP**

CLI defect - The *show configuration snmp* command does not display key value correctly for the “encoded base 64” option. 3 additional digits are appended, usually "Q==". So using the CPI example key "01234567890123456789ab", it is displayed in the show output as "01234567890123456789aQ==".

**Qos queue-map**

The default *qos queue-map* for eight queues is used with all scheduling policies.

**QoS class-map**

Router 6000 contains default class-maps and preconfigured class-maps. Both can be replaced with custom class-maps that are defined in your script. The default and preconfigured class-maps provide a default behaviour in 6000 in case you do not define any custom class-maps.

Examples of default class-maps are egress class-maps for Translation for Ethernet 802.1p Values, Translation for MPLS EXP, and Translation for Ethernet 802.1p and DEI Values. See CPI section “Default Class-maps for Egress QoS Propagation”.

Ingress class-map *ein-default-dscp-to-dp* is an example of a preconfigured class-map.

**Context Services**

There are three types of services on Router 6000: Context Services, Process Services, and Protocol Services.

There are two CLI defects in Context Services.

* Most Context Services cannot be configured in Router 6000.
* The Context Services shown are not the same ones that can be configured.

[local]DUT3(config)#service ?

console-break Enable console break by sending break sequence

counters Enable ARP/ND counters at VLAN level

domain-wildcard Allow the usage of a wildcard character (\*) in

domain names

history-username-display Enable saving the name of the command executing

user in command history

load-balance Config load-balancing hash key

multiple-contexts Allow the creation and usage of multiple contexts

process Enable process services

upload-coredump Upload coredump files to remote server

[local]DUT3(config)#show service

Context Services:

auto-system-recovery enabled

card-auto-reload enabled

console-break disabled

domain-wildcard disabled

inter-context routing disabled

multiple-contexts enabled

upload-coredump disabled

history-username-display disabled

**Card** – **clock-source, rate-limit**

CPI defects - Command *clock-source*, *rate-limit* in card command mode are not documented in CPI “Cards”. Command *rate-limit* applies only to DHCP and is documented correctly there.

**Different Ethernet Port types**

The *port ethernet* CLI command form varies based on what type of port is being configured. In the case of 6672:

* Option *1ge* can apply to ports 1-16
* Option *10ge* can apply to ports 9-16
* CLI command *auto-negotiate* can apply to 1ge or electrical ports.

Router 6672 supports the following physical ports as traffic ports:

* Eight GE SFP ports — Ports 1 to 8
* Eight GE/10GE SFP+ ports — Ports 9 to 16
* Four 100/1000 Base-T RJ45 ports — Ports 17 to 20

The following two commands are not equivalent. Once you begin configuring a port, you can use only one form.

port ethernet 1/9

port ethernet 1/9 1ge

**Service-instances**

Service-instances have prerequisites and these are not clear in CPI.

* A service-instance requires *encapsulation dot1q* to be enabled on an Ethernet port.
* Associating the service-instance with a bridge or *xc* requires that a match condition exist on the service-instance.

**OSPF** – **sham-link, area-type stub**

* CLI command sham-link must be in a vpn context.
* CLI command area-type stub must be for non-zero area.

**BGP** – **next-hop-self**

There are two forms of the BGP next-hop-self CLI command and this can be confusing.

* For BGP neighbor or peer-group configuration: next-hop-self
* For BGP neighbor or peer-group address-family configuration: next-hop-self ebgp, next-hop-self ibgp

See CPI section “ Advertising "Next-Hop-Self" to iBGP Neighbors” for further details.

**MPLS** – **decrement ttl**

There isn’t a “no” form of MPLS CLI command *decrement ttl*. Therefore, the command has no effect. The default behavior (enabled) cannot be changed.

**MPLS** – **bypass lsp**

The CLI command *egress* is used to specify the label-switched router (LSR) in a label-switched path (LSP). However, when configuring MPLS bypass lsp node protection, command *egress* may not be used.

**BGP** – **ebgp-multihop**

This CLI command configures the maximum number of hops used to reach the eBGP neighbor when the neighbor or peer group is not directly connected. The command may not be used for an internal peer-group.

**RADIUS** – **radius source-port**

CLI defect - This CLI command exists in both global command mode and context mode. The syntax for the command is different for each command mode. However, while in context mode, the CLI accepts both the global syntax and the context syntax. This is a CLI defect. The behavior of a CLI command with two modes is not defined in CPI.

Moreover, "help" shows the context syntax, even though CLI accepts either global or context syntax.

**Bridging** – **description (Bridge)**

CPI defect – This command is described in the Commands CPI and used as an example in the procedure "Create a Named Bridge" but it is not documented in the Command Hierarchy of the Bridging CPI.

**VPWS (L2VPN)** – **backup-peer**

The syntax for this CLI command is: backup-peer peer-address [pw-id *pw-id*]. CLI does not accept argument pw-id in peer-profile command mode. This is noted in CLI as “You can configure a backup PW ID that is different from the primary PW ID only in PW instance peer profile configuration mode.”

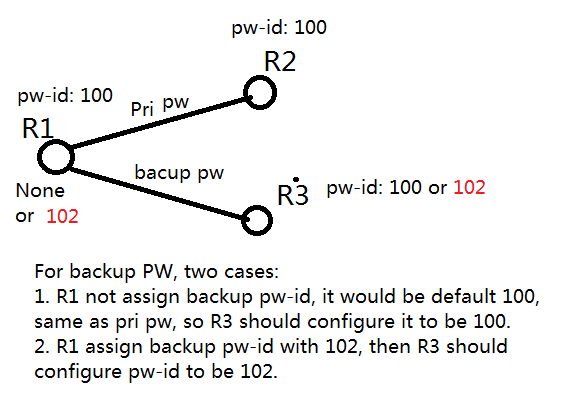
Below is an example to illustrate this restriction.

[local]Ericsson(config)#pseudowire-instance 1

[local]Ericsson(config-pw-instance)#pw-id 100

[local]Ericsson(config-pw-instance)#peer-profile PE1

[local]Ericsson(config-pw-peer-profile)#backup-peer 13.1.1.1 pw-id 102



**Link Aggregation Groups – lacp hold-timeout**

The CLI command lacp hold-timeout is supported SSR but has been removed for Router 6000.

**DNS** – **ip name-servers**

CPI defect – The CLI command “ip name-servers” is used in SSR but not in Router 6000. However, the CLI command “ipv6 name-servers” is still present in CPI. It should not be used on Router 6000.

**DNS** – **ip domain-name, ip domain-lookup, ip host (context)**

CPI defect – These CLI commands are not listed in any Configuration Command Hierarchy.

**OSPF – nonstop-routing**

The NSR feature is not supported in R6K in 17B onwards. The commands have been removed from CPI.

**BGP peer group: log-neighbor-changes**

This command is only supported in BGP Router command mode. It has been removed from BGP peer group command mode.

**RST Model Version**

This field in the EDI should not be modified. It tells RST the field release of the EDI.

**Excessive logs**

A business rule in RST will generate a warning when an Interface is not bound to an Ethernet Port. The warning will not prevent RST from generating a script. The business rule is required because a 6000 product behavior can create excessive logs that stop the script execution and require a router reboot.

The CPI product recommendation regarding Interfaces is “For higher layer protocols to become active, you must bind a physical port or circuit to an interface.” However, some router services generate excessive messaging, and if a route is not available because the Interface that the service uses is not bound to an Ethernet port, then logs are generated. These logs are not throttled, so if either the console is being monitored or *terminal monitor* is active on another Ethernet port, the router becomes disabled trying to display all the logs. So although it is only a product “recommendation”, the impact to the router is serious if not followed.

An RST business rule checks whether the Interface is present in these tables and fields:

Ethernet Ports: bind interface (port), bind context (port)

Ethernet Ports: bind interface (pvc), bind context (pvc)

Link Groups: bind interface, bind context

Link Groups: bind interface (pvc), bind context (pvc)

Bridged Virtual Interface (BVI) Ports: bind interface, bind context

The RST business rule ignores these interfaces:

* type = loopback, p2p, or multibind
* ip unnumbered = <value>
* ipv6 unnumbered = <value>

**Router - Bridge Profile - mac-limit**

This CLI command has a range that is limited by 3 different things: CLI, VLAN domain, and System (6672, 6675…). RST however only checks the CLI range because it is the largest bound. It is up to the user to check the other two limits as part of the planning. The ranges are listed in the CPI and the EDI Reference Sheet.

**Link Groups - start-vlan-id to end-vlan-id**

When using the “through” operator in field “start-vlan-id to end-vlan-id”, do not use the fields: ip host (pvc), bind interface (pvc), or bind context (pvc). These fields apply to a single VLAN and cannot be applied to a range of VLANs, such as is created by the “through” operator. In the example below, the *bind* command line will be ignored because it cannot be applied to 4 different VLANs.

link-group lag4

description Dot1q pvc 104 through 107

encapsulation dot1q

dot1q pvc 104 through 107 profile 8021p-on

description Vlan104\_107

*bind interface LAG\_Dot1q\_104 local*

qos policy policy1 policing

**CPI issues**

This table lists Configuration Management defects that are open between BNEW and the CPI Team.

|  |  |  |  |
| --- | --- | --- | --- |
| **CPI** | **CLI command** | **Query or Defect** | TW's Replies |
|  |  |  |  |

# Router Scripting Tool (RST)

RST is an offline, PC-based tool which imports an EDI and exports a Router 6000 script file.

## Delivery

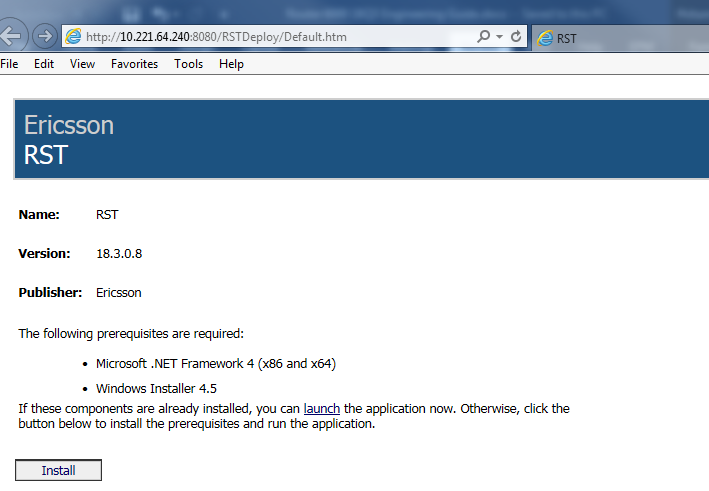
1. RST will be installed by clicking on an Ericsson internal web link. Although RST is installed from a web link, it is not executed online. It is installed and executed on the user’s PC.
2. RST has automatic updates. Each time RST is started, it will check the server to see if there is a new version of the tool or supported data files on the server. If there is new content on the server, the updates will be downloaded and installed automatically with user approval.

## Features

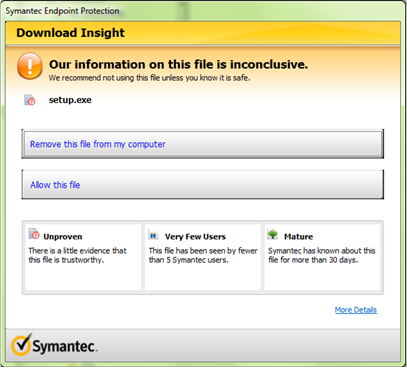
1. An EDI (xlsx) spreadsheet is used for customer input.
2. The EDI is imported (single or bulk) into the tool in which a project is created. Routers are sorted by ID or name.
3. Parameter modification possible on one or many routers.
4. Parameter validation is performed. It is “value range” only and performed on as many parameters as feasible.
5. A CLI script file is created per router.
6. It supports one file per router.
7. The project is saved locally on the PC.

## Installation

1. Navigate to this link and select the “Install” button. <http://10.221.64.240:8080/RSTDeploy/Default.htm>



1. After downloading, select “Run”.
2. RST does not require a security certificate. Ignore this warning. Select “Run” or “Install” at the warning window.
3. Ignore any Symantec warning such as the one below. Select “Allow this file”. Every new installer is whitelisted with Symantec, but this takes a few weeks. After whitelisting, the warning does not appear.



1. RST will start automatically after installation.
2. Select Export, Import, and Profiles directories when prompted.

For example:

Export Dir: c:\popdirs\export

Import Dir: c:\popdirs\import

Profile Dir: c:\popdirs\profile

## Update and Rollback

After installation, RST will automatically install new versions when available, as discussed in section Details of steps.

The rollback capability of RST allows you to re-install the previous version if you find a new version is faulty. Here are the steps to do this.

Start – Control Panel – Programs – Uninstall a program

RST – Uninstall/Change

Restore the application to its previous state

The rollback action prevents further automated updates to the RST program. To restart automated updates, uninstall RST completely as follows. Then install again as described in section [Installation](#_Installation).

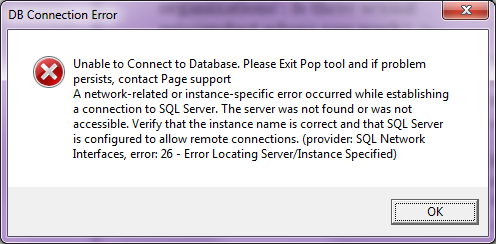
Start – Control Panel – Programs – Uninstall a program

RST – Uninstall/Change

Remove the application from the computer

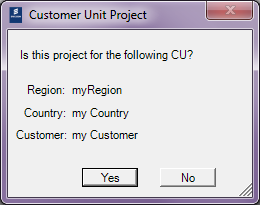
## Working without a connection to Ericsson

When started, the RST program will try to connect to the Ericloud server within the Ericsson domain to check for RST updates and to record what regions you are working on. If there is no connection to Ericsson, it will show a “DB Connection Error” after a 1 minute timeout, before the program will start.

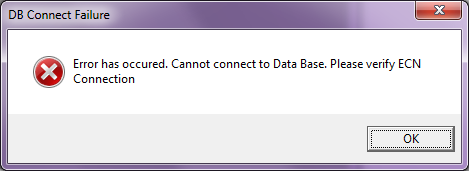


If you do not have a connection to Ericsson, it is recommended that you do not choose a “Customer Unit” and ignore the Data Base errors as follows.

1. File – New. Select “No” in the following dialog.



1. Ignore the following errors.



1. Continue with the normal ways of working, such as File – Import - <EDI>.

## Limitations

1. RST is an internal Ericsson tool.
2. RST creates script files for new sites. Expansions to an existing site are not supported.
3. RST does not save information into a centralized database. It saves information locally onto a user’s PC.
4. RST cannot export a blank or populated EDI.
5. RST cannot directly import a *show configuration* file from a router. See [Converting a Config File to an EDI](#_Converting_a_Config).
6. Migrations from existing routers are not directly supported. However, the process in [Converting a Config File to an EDI](#_Converting_a_Config) can be used.
7. RST supports field releases 18Q2, 18Q3, 18Q4.
8. RST supports products 6672, 6675, 6371, 6471/1, 6471/2, 6274, and (indirectly) TDM 1001.
9. RST does not have a support contract.
10. Implementing software updates to Router 6000 are not supported.
11. Running script files with an “on-line” connection to the Router 6000 is not supported.
12. Auto-integration support is limited to what is described in chapter Auto-integration.

## Steps to create a script file for one new Router 6000

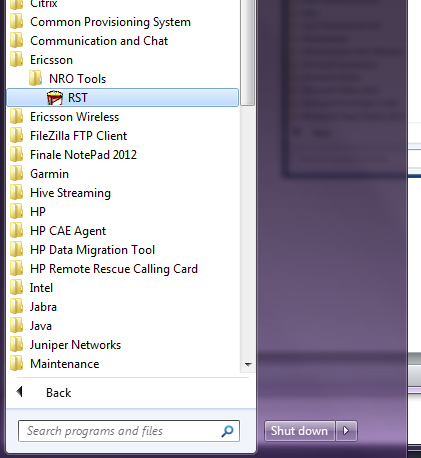
The following steps illustrate how to create a script file for one new Router 6000.

### Overview of steps

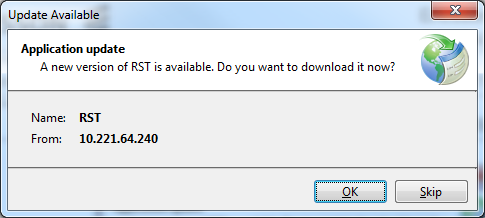
* Complete the EDI
* Start RST
* Create a new project
* Import the EDI
* Correct errors
* Export the network
* Review the script file

### Details of steps

1. Complete the EDI and review it with the customer. This step is the quality gate. A review is important because it will correct errors at this point, rather than at a more expensive point later in the process.
2. Start the RST program on your PC. To start, Start – All Programs – Ericsson – NRO Tools – RST. See below.



RST will also check if a new version of the program is available. If so, select “OK” to download it. See below.

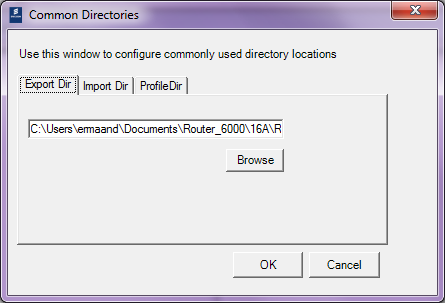


1. On initial install, select the profile directories as seen below. Here are some example values.

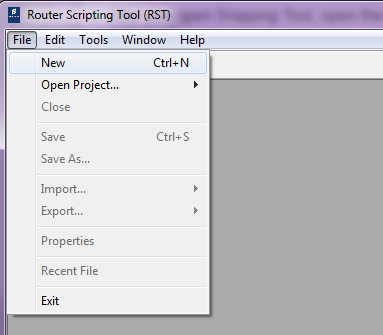
Export Dir: C:\Users\<user>\Documents\Router\19Q2\RST\export

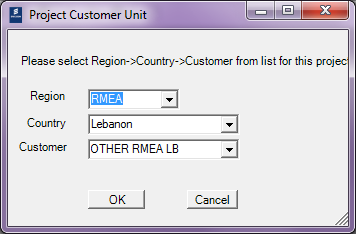
Import Dir: C:\Users\<user>\Documents\Router\19Q2\RST\import

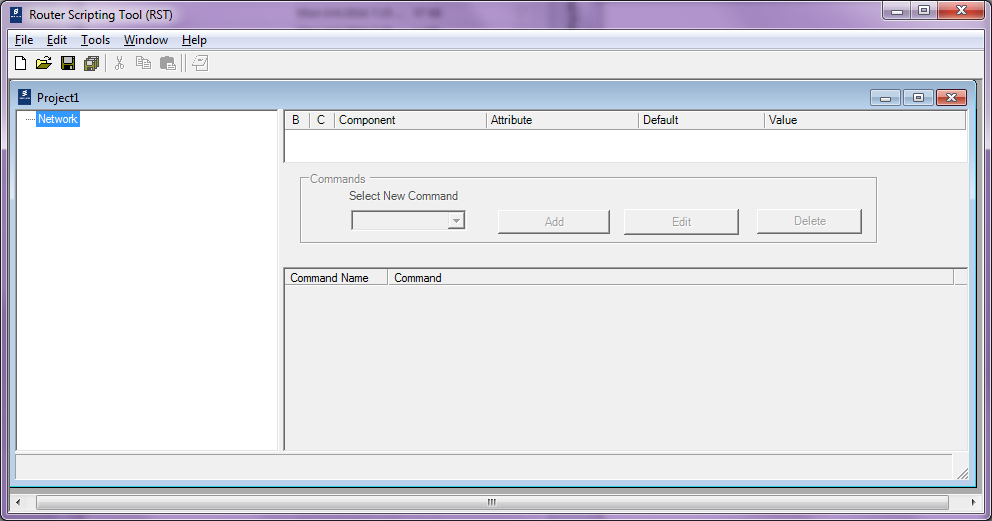
Profile Dir: C:\Users\<user>\Documents\Router\19Q2\RST\profile



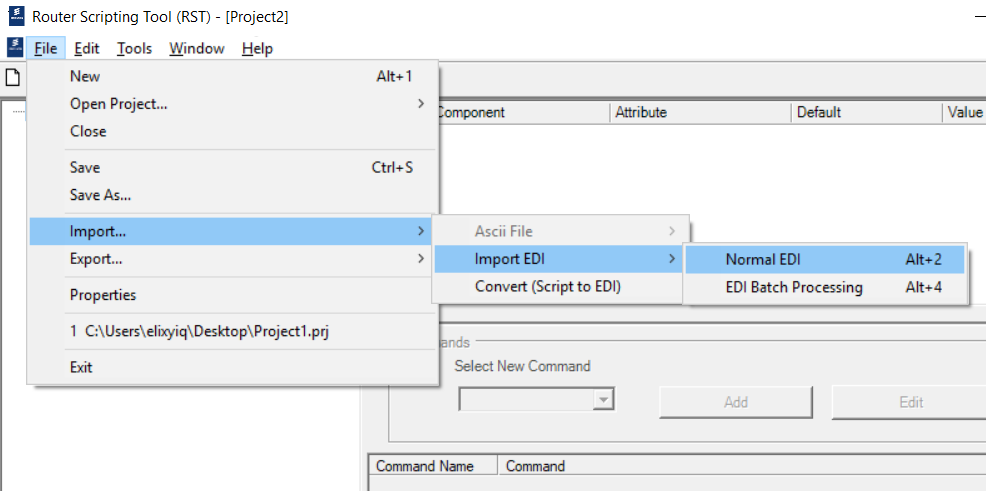
1. Create a new project. RST – File – New. Select a Customer Unit. Project1 is created. A project can consist of several networks. For this example, we will use one project with one network. See below.

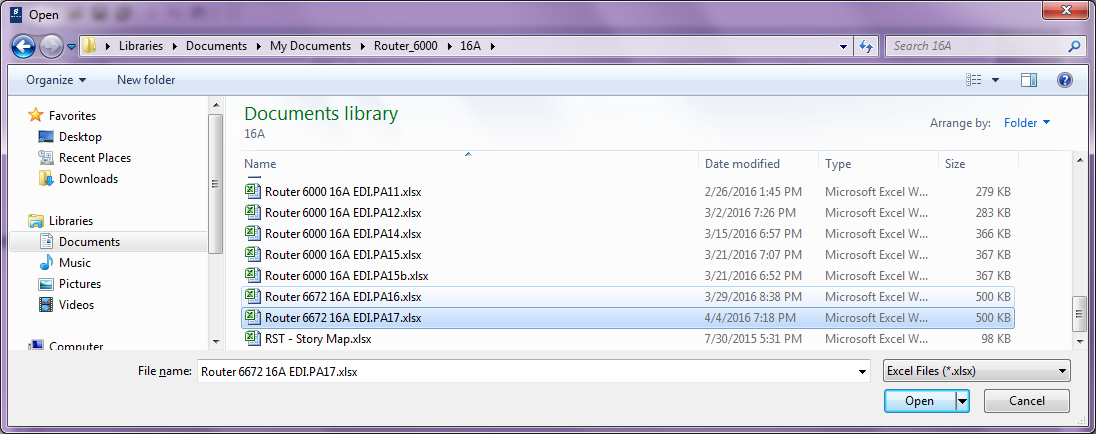




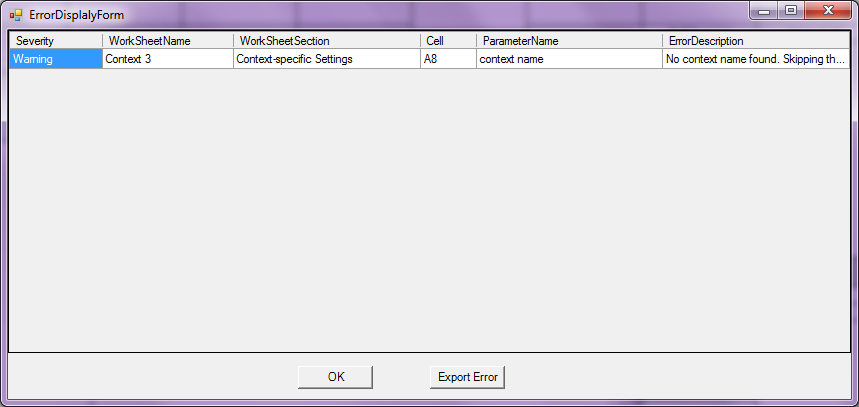


1. Import the EDI. To import, File – Import – Import EDI – Normal EDI. In RST, this creates one network. A network represents one router. See below.



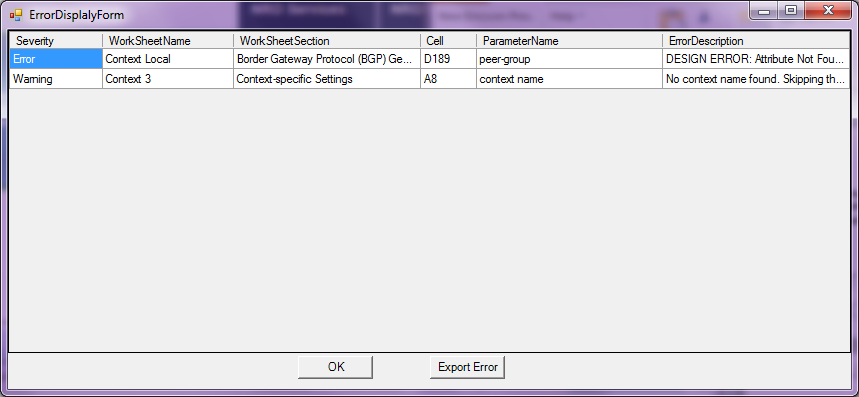


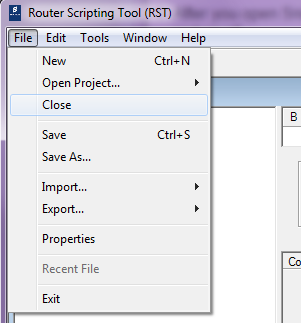
1. The results of the import are shown in the “Error Display Form”. If there are no import errors, select OK. Warnings are different than errors. Warnings should be investigated, but need not stop the process of creating the script file. See below.



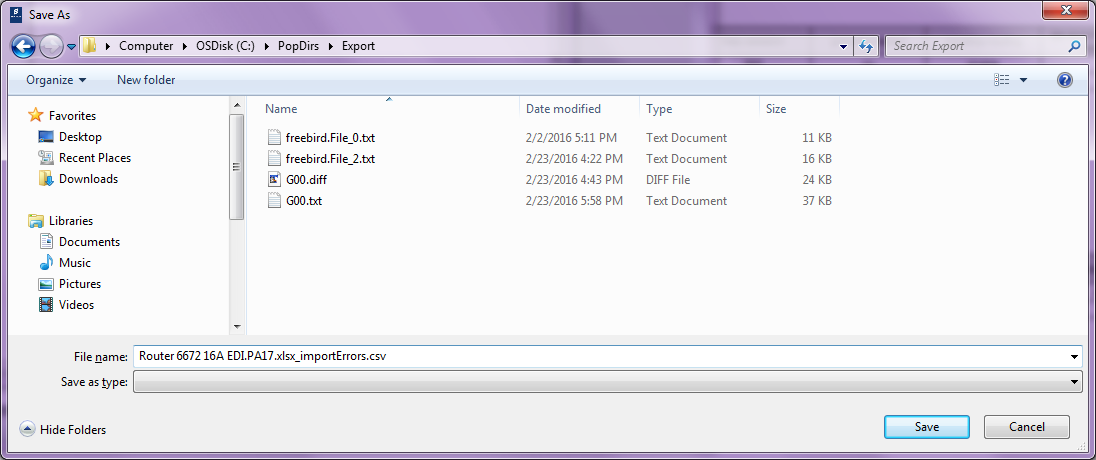
1. If there are Import errors (see below), correct the EDI, close the project, and go back to 4. To close, RST – File – Close. It is more reliable to close the project rather than to re-import the EDI because a re-import only makes additive changes to the network. Deletions are not performed.

You can alternatively create a new project (Project2) without closing the first one (Project1). Just make sure the new project is the active one.

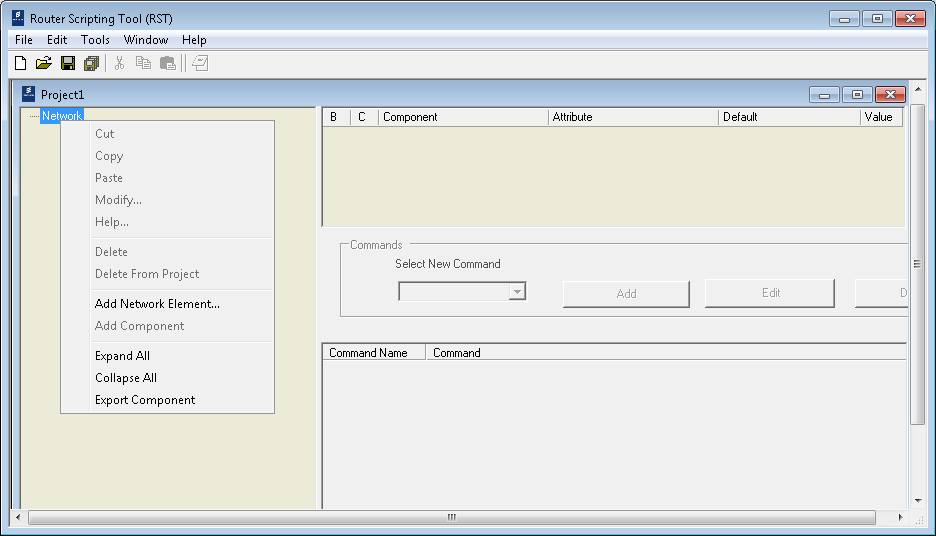


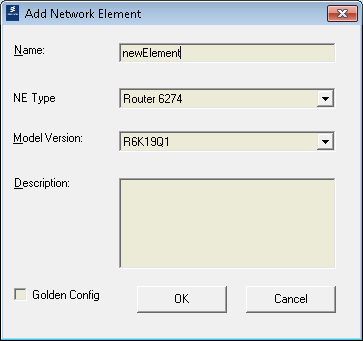


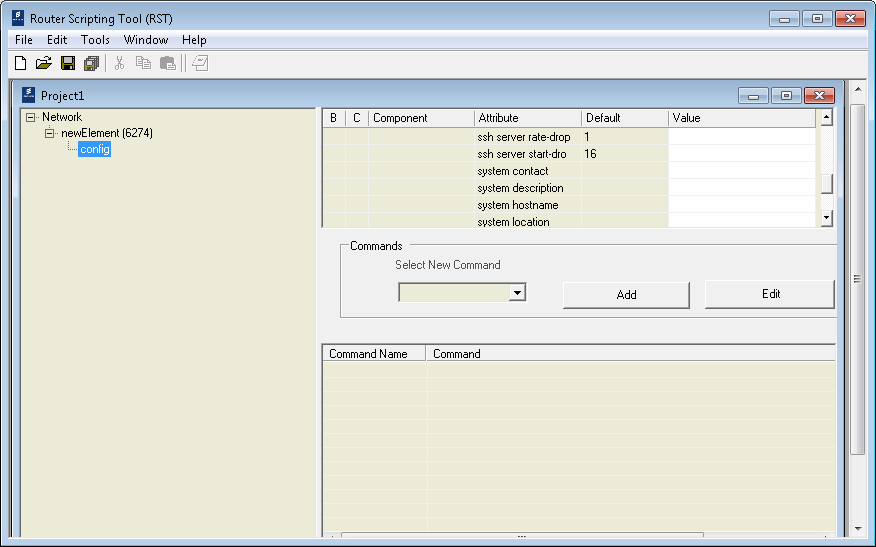
1. Errors can be exported by selecting “Export Error”. They are exported in a CSV format. See below. A CSV file can be opened by Excel. RST lists each error by showing the worksheet, section, and cell that caused the error, so it is easier to find the source of the error.



1. Create new node on Treeview. You can create a node directly instead of importing an EDI. Right click on “Network” – Add Network Element

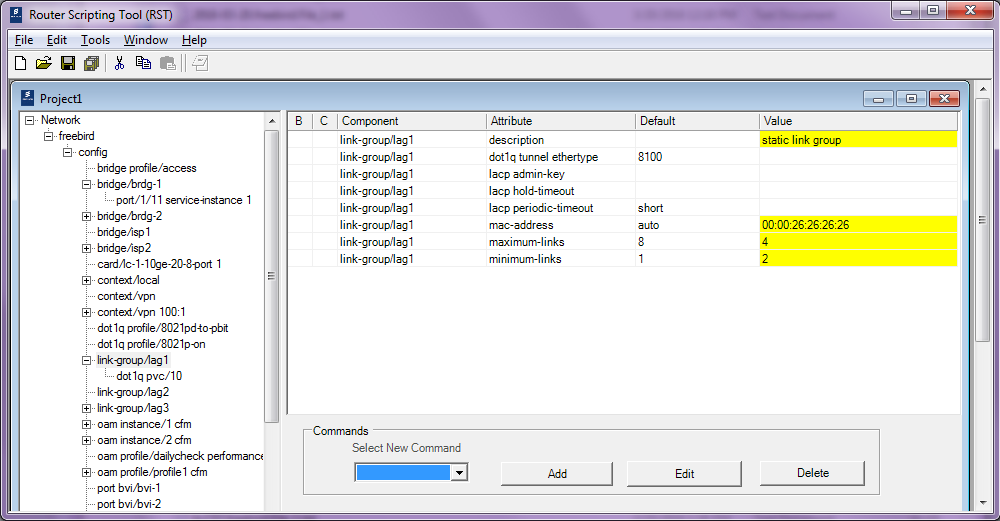


Fill out the name and select device type and model version. Click “OK” to submit. 



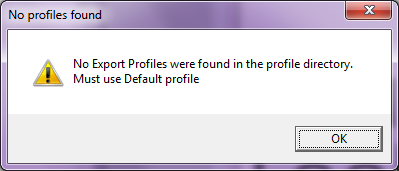
Now , you have created a new node in project.

1. Make custom modifications if necessary by modifying parameters within RST. See below. This is not recommended because then RST and the EDI would no longer be in sync. Instead, it is recommended to correct the EDI, close the project, and go back to step 4

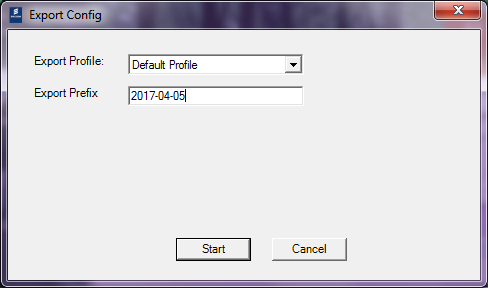


1. Repeat steps 5-9 for all the routers you want in this project. Having one router per project is also fine. The exported script will be the same in either case.
2. Export the network. This creates the script file. To export, File – Export – Export All. If no Export Profiles have been created, a warning window states that the “Default Profile” will be used. See below. The Default Profile exports the script in the same order as the “show configuration” command. This order seems to also work best when running a script file.

Leave field “Output Format” at the default setting of “CLI Manager Format”. That is the only format supported in this release. Select “OK” to export.

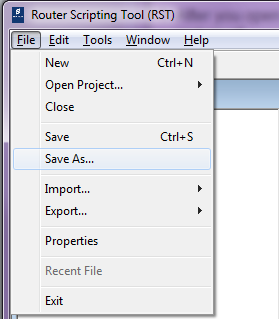


1. Create the script file. In the “Export Config” window, optionally enter an “Export Prefix”. This is a string that is used to name the output script file. See below. The full script file name is <Export Prefix>.<system hostname>.File\_1.txt. In my example it will be 2016-04-05.freebird.File\_1.txt. One script file will be created for each network (i.e. router).

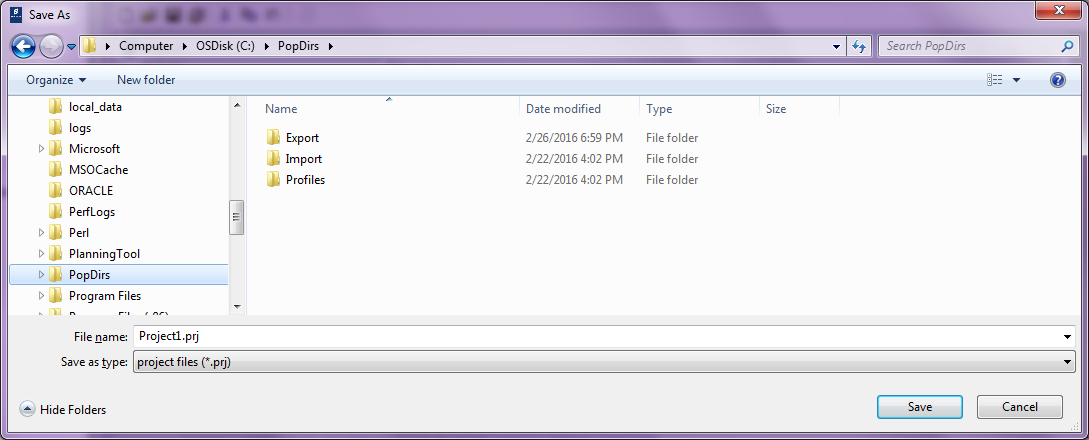


1. Review the script file by comparing it to the EDI.
2. Send the script file to site.
3. If no custom modifications have been made, close the project, and exit RST. Otherwise, the project may be saved to be worked on later. To save, File – Save As – Filename. To exit, File – Exit. See below.

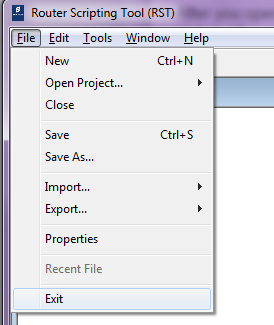
File – Save As:



File – Save As – File Name:



File – Exit:



## RST Data Validation

As part of the “Import EDI” step in RST, validation is performed on the data that is imported from the EDI. Generally, all EDI fields are compared with the range that is listed in the Reference worksheet (which is the same as that listed in the Commands volumes in CPI). However, there are a few limitations to this.

**Multipart fields**

Some EDI fields are part of a group that makes a single CLI command. So the validation is done on the entire group. The Error Cell listed by RST in the EDI Import Error List is usually all the cells in the group, but sometimes only the first cell is listed.

In some cases, leaving the key field in this group blank could generate a configuration error when the script is loaded on the router. For example if you entered a value for the BGP field *nexthop triggered backoff* and leaving *nexthop triggered* *holdtime* blank. In this case and in most cases, RST flags an error.

**Invalid Key**

Some EDI fields form a key. If the key is bad, the rest of the row will be ignored. The Error Cell field will be listed as Unknown. For example in EDI table Route-maps, the key fields are: map-name, action, seq-num. If these cells contain invalid data, the rest of the fields in this row are ignored.   
The simple workaround is to look at the Message field in the EDI Import Error List. In this case it lists enough information to find the bad key:

Invalid key for sub command level: Invalid value. Key Value = enable hello

**Datatype Word**

Some EDI fields correspond to a Router field of datatype Word. A Word is any non-breaking alphanumeric string. This is a large range that makes data validation less helpful. For example, in EDI table Route-maps, these fields are of datatype Word: match ip address prefix-list, match ip next-hop prefix-list. For datatype Word, RST accepts any non-breaking string.

**Datatype Line**

Some EDI fields have a wide enough range that RST treats them as datatype Line. A Line is any string. For example, in EDI table Route-maps, table set community has the following range. RST treats it as datatype Line and does little data validation.

unsigned decimal: 0–4,294,967,295

ASN: nn:mm, 0–65535, 0–65535

**Hostname**

Field hostname in table EDI table “Initial System Configuration” must not be blank. RST will abort the entire EDI import if it is blank. It uses the hostname to name the export files.

**Context name**

Field name in EDI table “Context-specific Settings” must not be blank for the context to be used. RST will ignore the entire context if this field is blank.

**Field names**

RST checks whether every EDI field name (i.e. table header in grey) matches its definitions. If a field name is modified, removed, or a new field added, then an EDI import warning will be generated and that field will be ignored. RST only checks EDI tables that contain data values.

If you are using an older EDI template, you may also see this error. If RST says that some EDI fields are missing in your EDI template, you can ignore this error as long as you do not need to set a value in these new fields.

You may add more rows in the data space. The datat space is the white cells in each table beneath the grey header row.

**Tool Tips**

If you are unsure whether a command or parameter was imported correctly, see if it is present and correct in the Navigation/Attribute/Command Panes. The Attribute Pane has Tool Tips. Tool Tips are displayed when you hover.

You may see a Tip like “Line Community Value - Warning No validation available for this parameter in the tool”.

**Commas in Integers**

Commas are not supported by RST in integers. For example, you must enter 4294967295 instead of 4,294,967,295.

## Other RST tasks

This section illustrates other RST tasks. These tasks are optional and are not required to generate a Router 6000 script file.

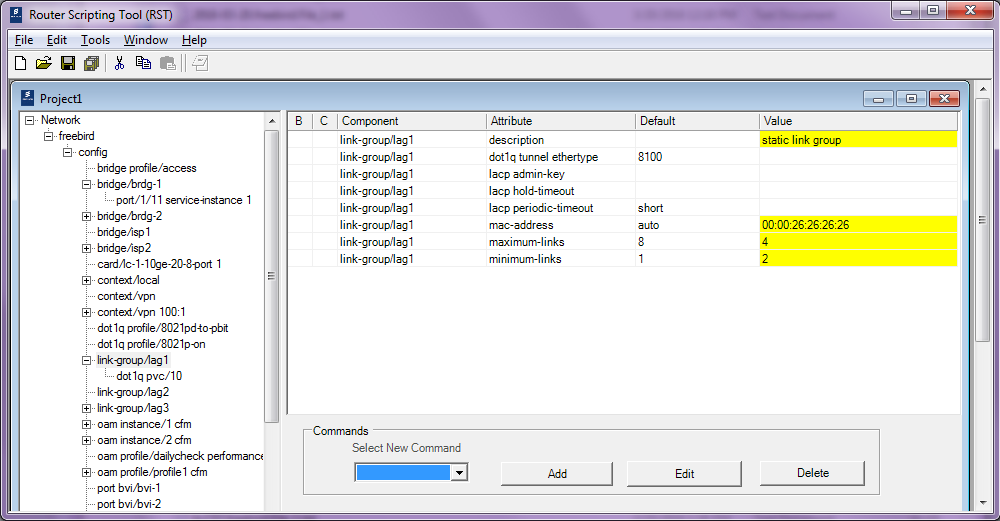
### Overview of tasks

1. Edit a parameter
2. Delete a parameter
3. Copy and paste a parameter
4. Add an optional command
5. Add an Export Profile
6. Converting(Script to EDI)
7. Batch Processing

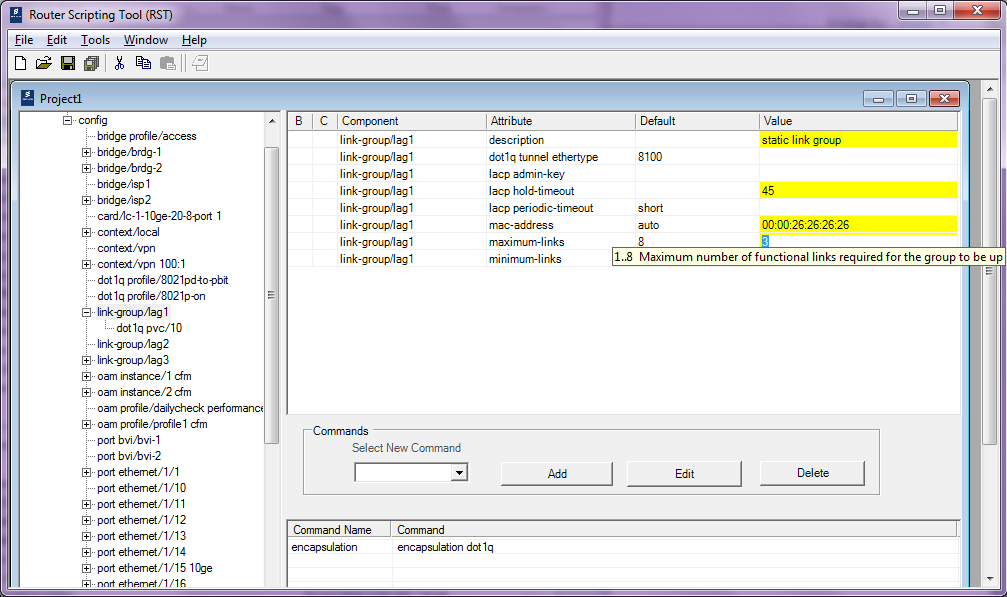
### Details of tasks

1. Edit a parameter.
2. In RST, the left pane shows the object tree. The top right is the attribute pane. The bottom right is the command pane. See below.
3. Expand the Object tree on the left to view the hierarchy of command levels. Find the object of interest. In this example it is link-group lag1.
4. The parameter lacp hold-timeout is not set so it appears blank in the attribute pane. In the script file, it would not be set, so the default value would be used on Router 6000. In RST, I enter a value of 45 in that cell. The cell color changes to yellow to indicate a non-default value will be used. The value 45 will now be used in the script file.
5. The parameter maximum-links has a desired value of 4. The cell is yellow. If I hover over the cell, I see the tool tip. It lists the range and description of this parameter. I enter a new value of 3. The cell is still yellow indicating a non-default value will be used.
6. See the “After edit 1” image to show the results of both parameter changes.

Before edit:

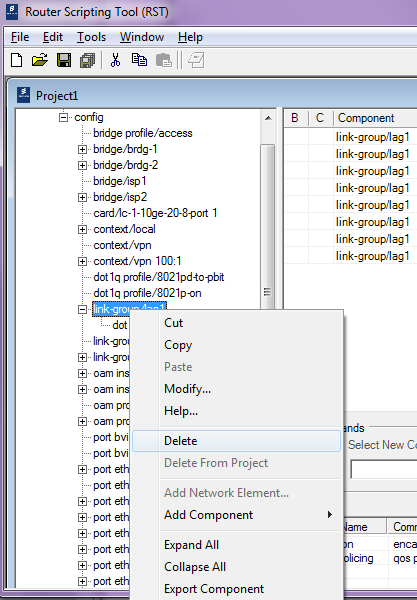


After edit 1:



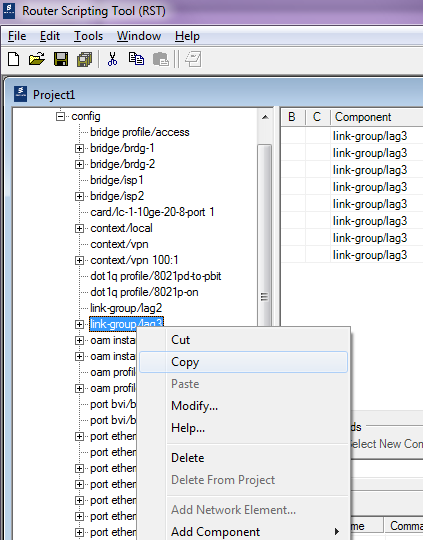
1. Delete a parameter
2. Delete. Select a parameter in the Navigation pane and delete it. Parameter – Right – Delete. In this example, link-group lag1 is deleted. See below.

Delete:

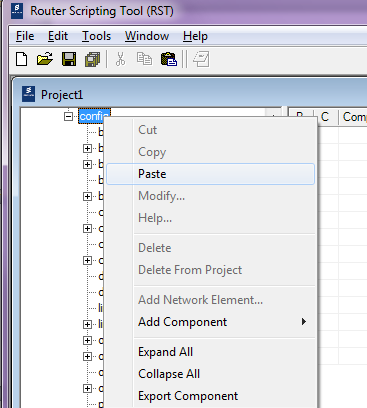


1. Copy and paste a parameter
2. Copy start. Select a parameter in the Navigation pane and copy it. Parameter – Right – Copy . In this example, link-group lag3 is copied. See below.
3. Paste. Paste the copied value into the config root. Config – Right – Paste.
4. ComponentValue. In window ComponentValue, change the name of the new parameter. In this example, it will be “lag1”.
5. Copy Complete. Select “OK”. Examine the new parameter. Except for the name, it will have the same values and children as the original parameter,

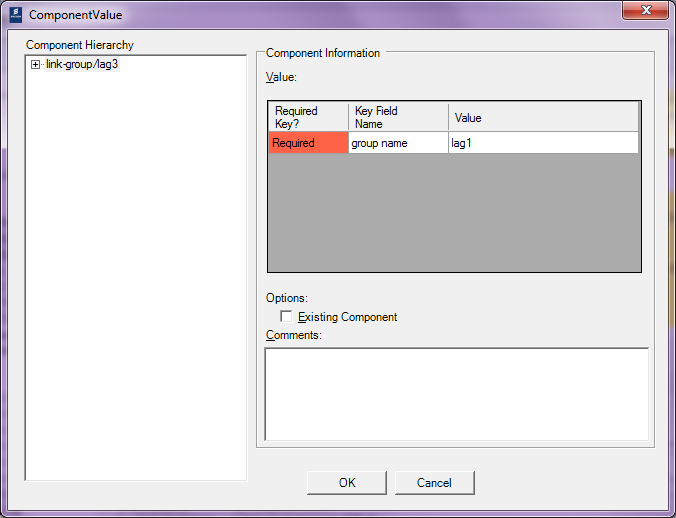
Copy start:



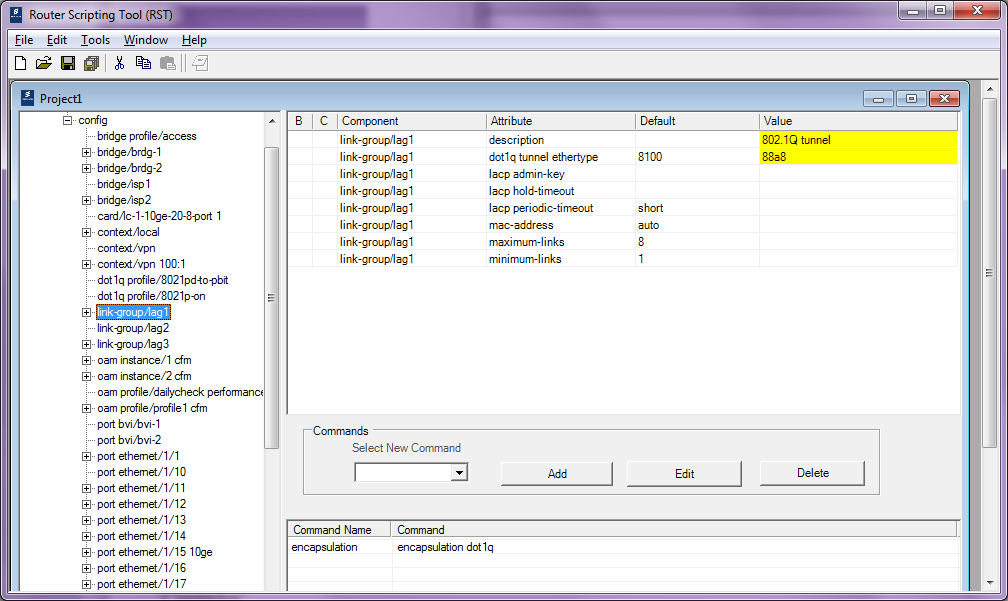
Paste:



ComponentValue:

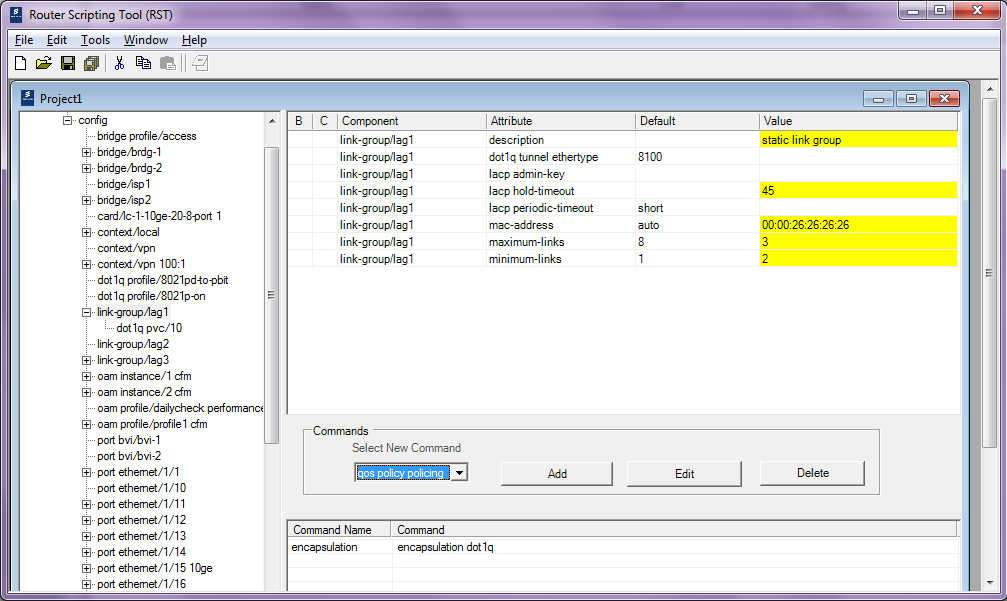


Copy complete:

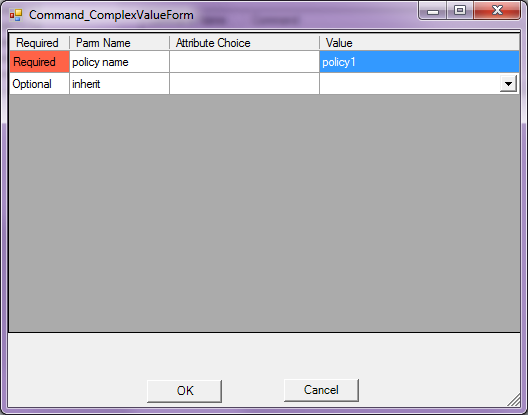


1. Add an optional command.
2. After Edit 1. To start, expand the Object tree on the left to view the hierarchy of command levels. Find the object of interest. In this example it is the same link-group lag1 as in the example 1 image “After Edit 1”. See below.
3. Before add. Add the optional command “qos policy policing”. Select this command from the “Select New Command” pull-down in the Commands Pane.
4. Command\_ComplexValueForm. Select “Add” and enter parameters. The window “Command\_ComplexValueForm” opens and requests required and optional parameters. Enter “policy1” as the value for parameter “policy name”.
5. After add. Examine the new command and verify it is correct.

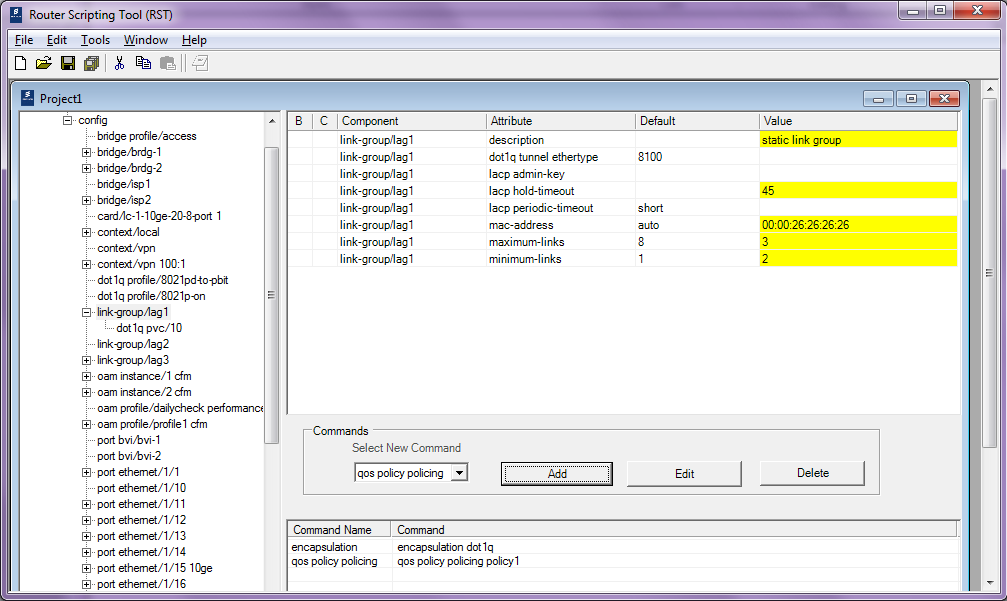
Before add:



Command\_ComplexValueForm:



After add:

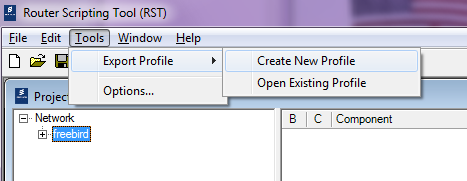


1. Add an Export Profile.

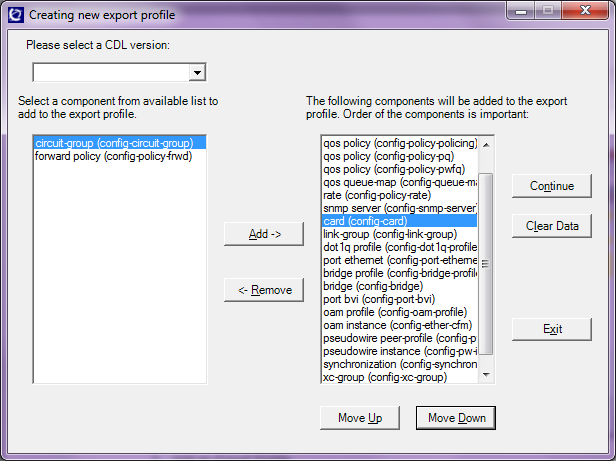
An Export Profile controls the order that each section (or EDI table) is placed in the script file. By adding a new Export Profile, it allows you to select a different order than that of the Default Profile.

1. Create new Profile. To start, RST – Tools – Export Profile – Create New Profile. See below.
2. Creating a new Export Profile. In window “Creating a new Export Profile, select “R6k18Q2” in field “Please select a CDL version”.
3. Create a new sequence of components. Select the component in the left panel and then select “Add” to move it to the right panel. Use “Move Up” and “Move Down” to adjust the sequence. Select “Continue” when done.
4. Save an export profile. In window “Save an Export Profile”, enter a file name and select “Save”.
5. Export config. In window Export config, export the network with the new Export Profile. File – Export – Export All. In window “Export Config”, choose the new Export Profile. Leave field “Output Format” at the default setting of “CLI Manager Format”. In the “Export Config” window, enter an “Export Prefix”.

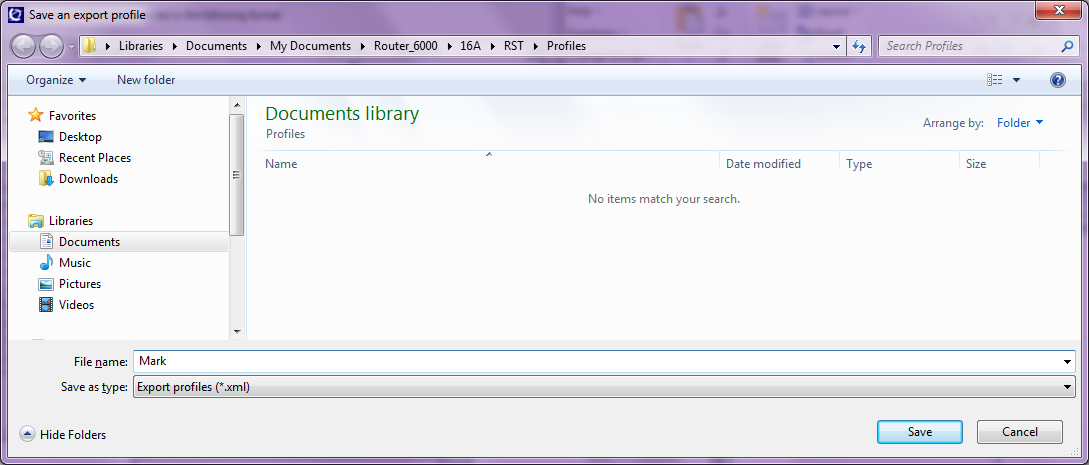
Create new Profile:



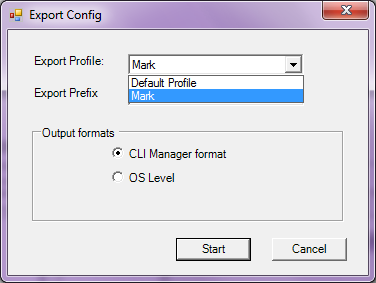
Creating a new export profile:



Save an export profile:



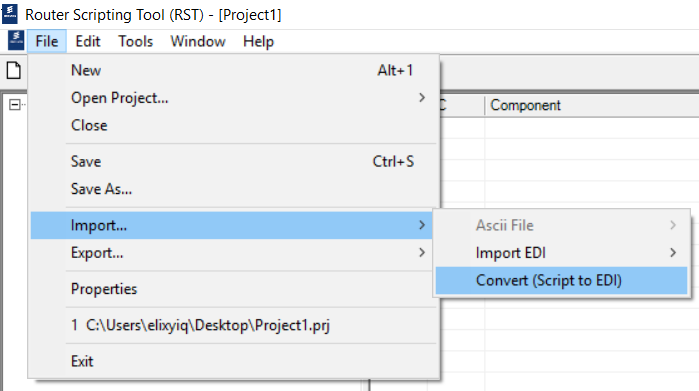
Export config:



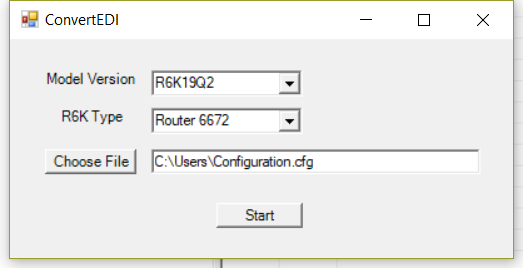
1. Converting (Script to EDI)

When you don`t have a filled EDI , but only a valid configuration file, using Converting (Script to EDI) to make a filled EDI.

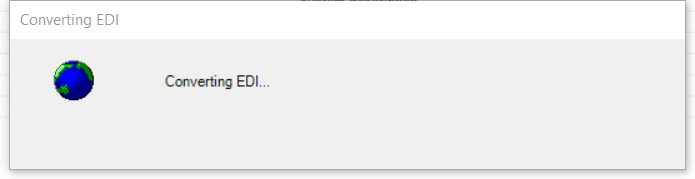
1. To start, RST – File – Import – Convert(Script to EDI). See below.

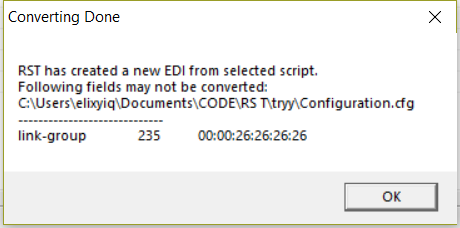


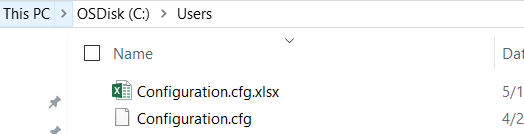
1. Select Model Version, R6K Type and target script file.



1. Click Start to run. Finally you got an EDI at the same location with the script file you selected. Details see below.



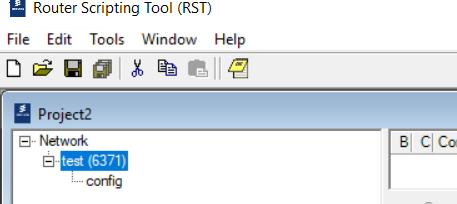




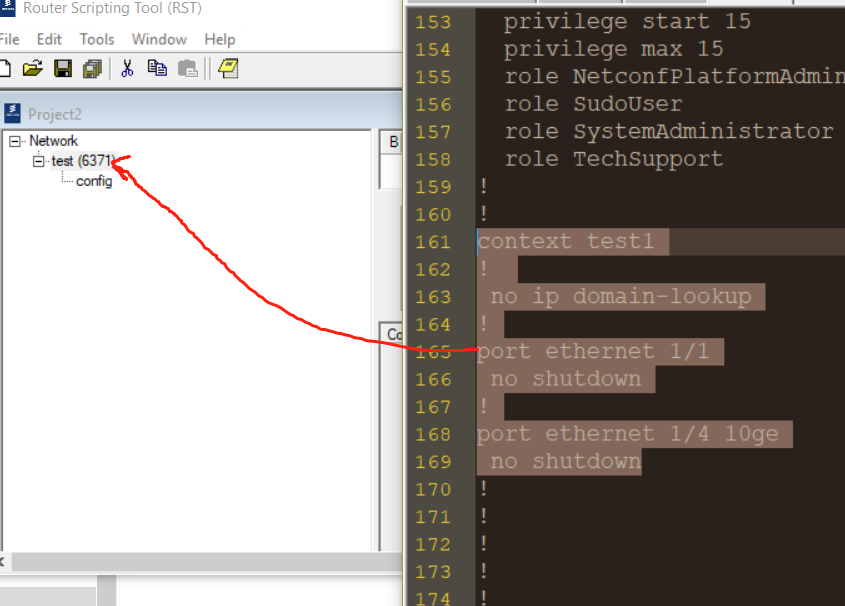
1. Drag operation

From the new RST 19Q4 version, user can directly drag scrips into the program to import. So they don`t need to manually modify the element nodes anymore.

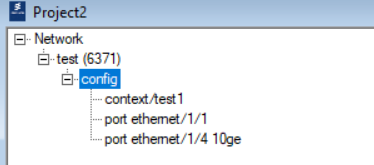
1. Use drag operation, you have to already created a element node().



1. Select some partial scripts(start from config layer) then drag it and release on the target node.



1. These part of scripts has been imported.



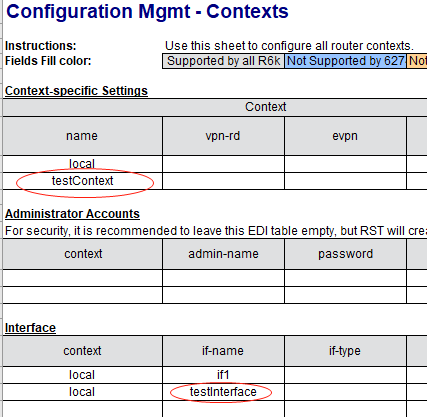
1. Batch Processing

Batch Processing can help RST generating multiple scripts with one EDI in one time importing. Before processing, you need to have a filled EDI first. Batching Processing will allow you to mark several fields as batch fields, and remains the rest same.

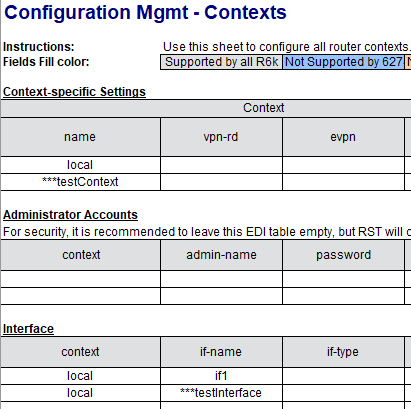
So for the final output scripts, most parts in the script is same for each output script, but only these marked batch fields are different with each other as you typed in.

Here are the detail steps:

1. Open a filled EDI, select the fields you want to batch processing. For example, we want to make the “testContext” and “testInterface” for this tutorial. And you could select any filed as you wish.

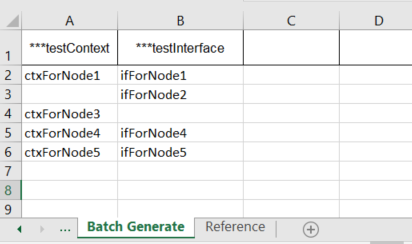


1. Add “\*\*\*” at start of these cell`s value. The ‘\*\*\*‘ will be solved as signal of batch processing, So any filed whose value start with \*\*\* will become a batch processing beacon.



Attention, you can change these beacons name to any value you want, just make sure that all beacons have different name with each other and start with \*\*\* .

1. Go to the sheet Batch Generate. Add batch beacons name in Row1 to create the batch processing columns.

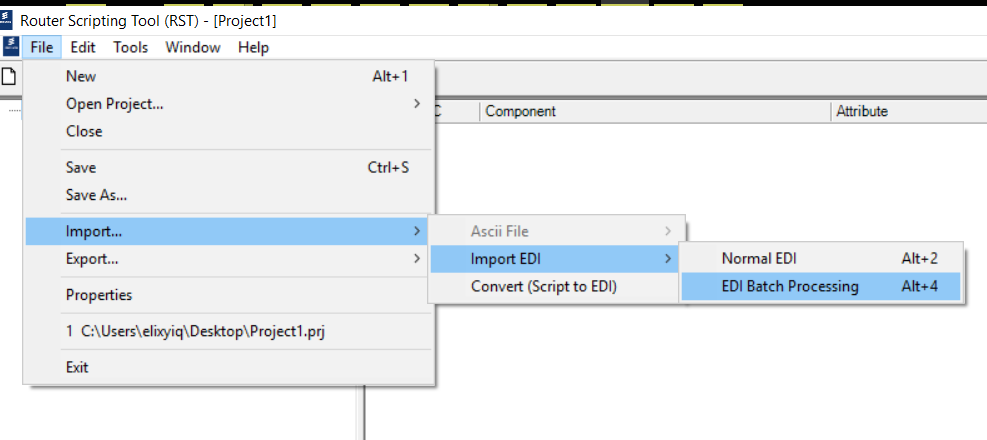


Add values for each column, as shows above. Here are two columns “\*\*\*testContext” and “testInterface”, from Row2 to Row6 are values for the two columns. In this table, RST will generate 5 scripts finally. The first node has a context name “ctxForNode1” and a interface “ifForNode1”, the sec one doesn`t has the context, and has a interface “ifForNode2”. Users can modify these values based on their needs.

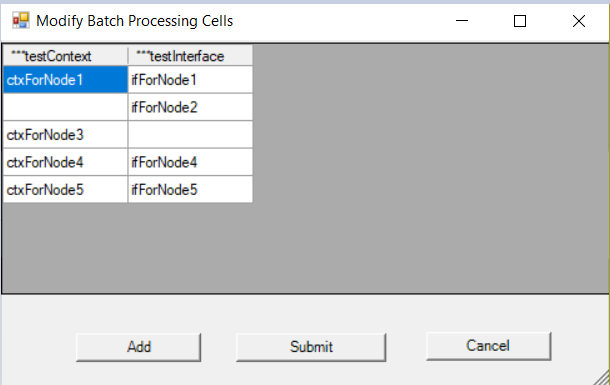
1. After you have a batch generating EDI, open RST and run batch processing.

RST – File – Import – Import EDI – EDI Batch Processing

Select target EDI file. Similar with importing a normal EDI.

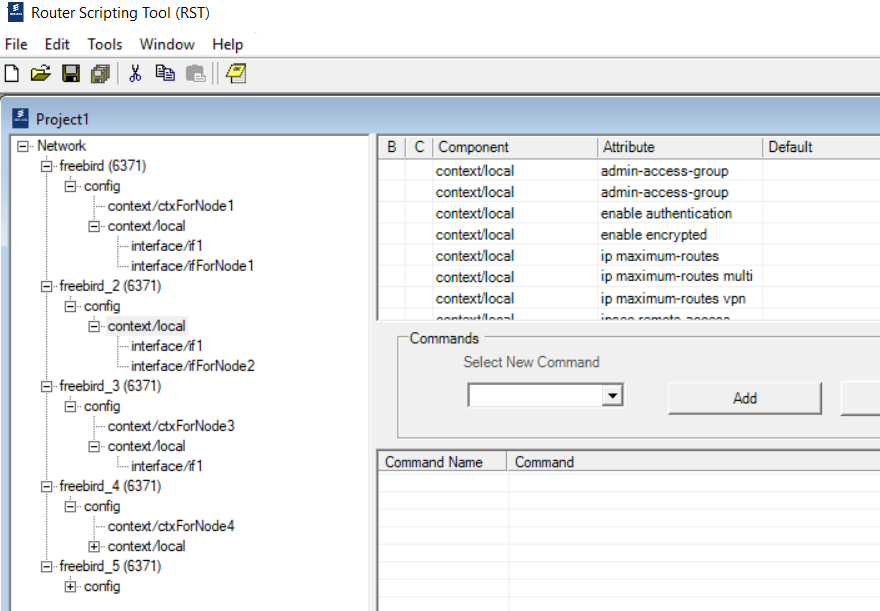


1. Re-modify and verify your batch processing table.



Each row means one node. Users can add, modify or delete (when leaving a whole row empty this node will be ignored) nodes in this page, but this modification won`t make an effect to original EDI.

1. After RST finish running, we have the multiple nodes treeview.



Same as our expectation, we have 5 nodes in total. And the node 1 has 2 contexts(local and ctxForNode1), 2 interfaces(if1 and ifForNode1). Node 2 only has one context(local), but 2 interfaces(if1 and ifForNode2). Node 3 has two contexts, but only 1 interface. Node 4 and 5 are also working well.

1. RST – File – Export – Export All / Export Single NE.

# EDI Examples and References

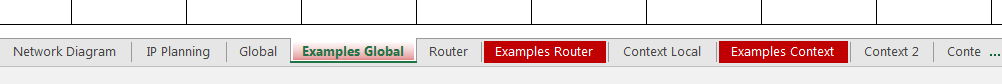
## Examples

Example sheets are included in the EDI template, and are listed below. They are not intended to show a real network. They are intended to show how to compete each field within the EDI.

* Examples Global
* Examples Router
* Examples Context

To see the Example sheets:

Excel – Sheet – Right click – Unhide



You can create a script file from these examples by copying each Example sheet into the active sheet. E.g. Copy ‘Examples Global’ to ‘Global’.

## References

The syntax of each command is listed in the “Reference” sheet. See example below. Click the Title in each table to jump to the Reference for that table. Enter <alt>-<left> to jump back.

|  |  |  |
| --- | --- | --- |
|  | **Remote Monitoring (RMON) alarms** | |
|  | rmon alarm | rmon event |
| CPI Volume | RMON and SNMP | |
| CPI Procedure | Configure RMON Events and Alarms | |
| Command Mode | global | global |
| CLI Range | interval: 1–2,147,483,647 secs |  |
| Default value | No RMON alarms are defined | No RMON events are defined |
| CLI command | rmon alarm *index object-id interval* {absolute | delta} rising-threshold *value [event-index]* falling-threshold *value [event-index]* [owner *owner-name]* | rmon event *index* [log] [notify] [owner *owner-name*] [description *text*] |

## Profiles

Profiles control the order of commands in the script file. It is recommended to use the Default Profile in RST. This is discussed in the section Steps to create a script file for one new Router 6000.

Alternatively, you can create your own Profile by editing a text file similar to the example below. To apply it:

RST – Tools – Export – Open Existing Profile

RST uses a different Default Profile for each release. These files are installed by RST. To find the current version of these files, you have to navigate deep into your file system:

C:\Users\<windows user>\AppData\Local\Apps\2.0

Search for:

R6K\*profile

Here are some example profiles:

## Example EDI’s from the Evolved IP Network (EIN) solution

Examples in the calstore EIN library can help you design your customer network. Aligning your network with these EIN examples gives you a tested and supported network design. The EIN examples are converted to EDI format here to make it easier for you.

Evolved IP Network (EIN) is a multiservice IP infrastructure solution including Access, Aggregation, and Mobile Core transport networks; developed to support an efficient evolution to all-IP. The evolution is secured with a tested and verified reference solution.

### 18Q2

The first CPI reference library is the “EIN 18Q2 Technical Library”. See [References](#_References).

The document “EIN - Test Configuration Report of SF 960: RAN Security Solution with MSMM” provides examples for a network of several Router 6000’s. The network has one scenario for one Router 6000 configurations.

[http://calstore.internal.ericsson.com/elex?LI=EN/LZN7640030/12R1A&FN=960\_12704-ipm10141\_18q2Uen.b.pdf](http://calstore.internal.ericsson.com/elex?LI=EN/LZN7640030/12R1A&FN=960_12704-ipm10141_18q2Uen.b.pdf%20)

The config files (created from the *show configuration* command*)* for this example was converted to release 18Q EDI files where possible, and are attached below. A script file for the resulting EDI file was also created and compared with the original config file to ensure the EDI was correct.



|  |  |  |
| --- | --- | --- |
| **1. Config file from EIN** | **2. EDI file** | **3.Script file from RST** |
| 2\_R6672 configuration.txt | Router 6000 18Q3 EDI.PG1\_VS.xlsx | 18q2-2.R6000\_3.File\_1.txt |

# Compare two EDI’s

The EDI files for different routers in a network might be very similar, perhaps only differing in a few IP addresses and names. You might want to create such an EDI by copying and pasting the original EDI and then editing the few differences.

## Spreadsheet Compare

To check that you have made the edit’s correctly, you can compare two EDI’s at a time using Spreadsheet Compare 2016. It is part of Microsoft Office and installed on Ericsson PC’s.

**Installation**

No installation is necessary.

**Execution**

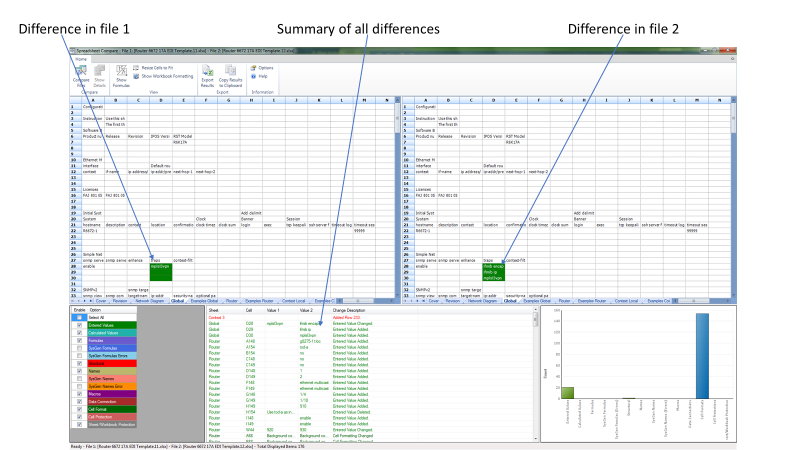
Start – Search Programs and Files – Spreadsheet Compare

Home – Compare Files

**Example**

The file 1 EDI is shown in the left pane. The file 2 EDI is shown in the right pane. The differences are shown in a color - green for Entered Values. Scroll through the Global, Router, and each Context sheet to check the differences.

Alternatively, a summary of all differences is listed in the bottom center pane. Select each one of these differences, one at a time, to reposition the left/right panes.



## Quick Compare

On some laptops, there is no Spreadsheet installed. Another method to compare two EDI’s at a time, is using Quick Compare 2016. It is part of Microsoft Office, installed embedded in Excel.

**Installation**

No installation is necessary.

**Execution**

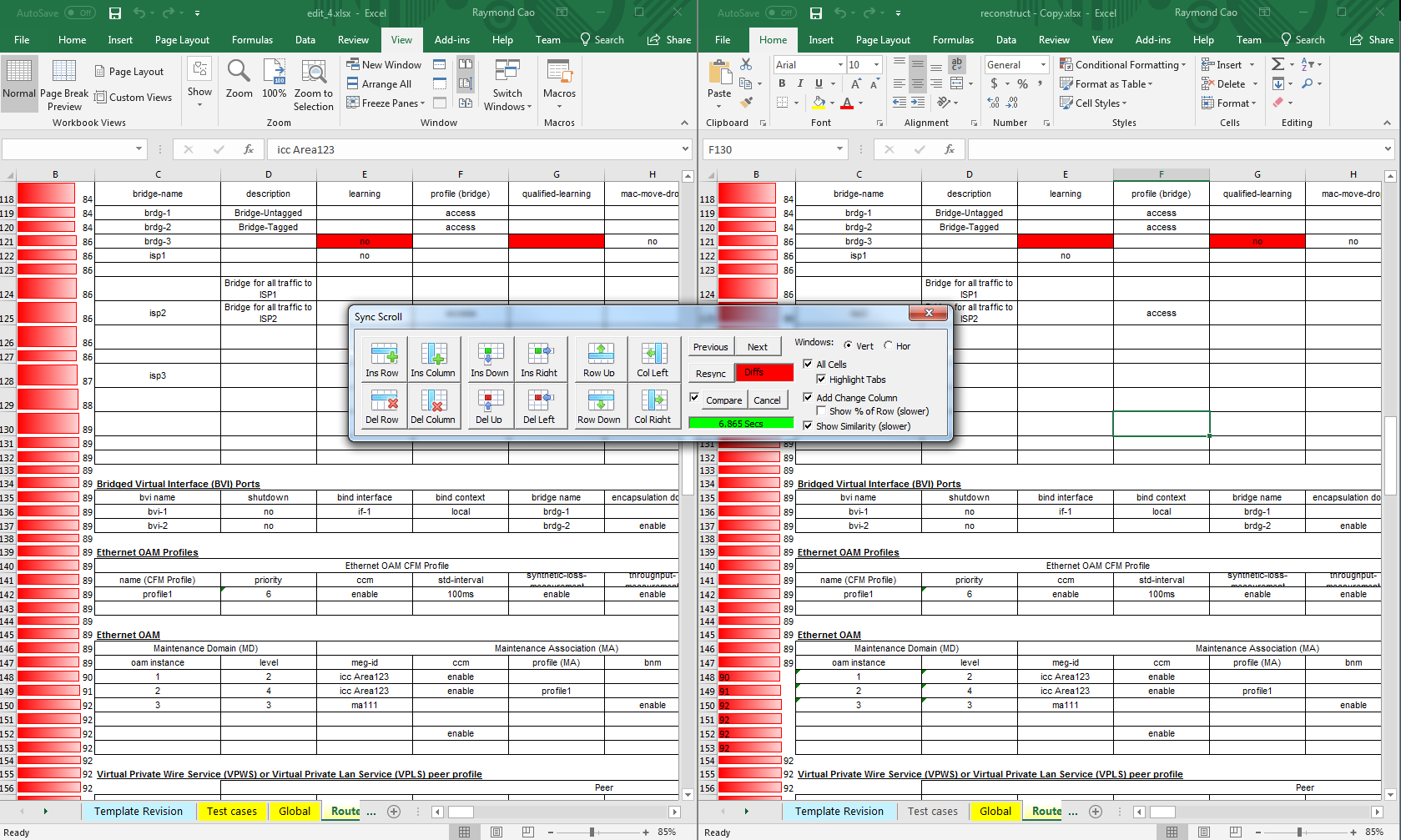
Excel – Add-ins – Quick Compare – Compare Files

**Example**

The file 1 EDI is shown in the left pane. The file 2 EDI is shown in the right pane. The differences are shown in red color. Scroll through the Global, Router, and each Context sheet to check the differences.

Alternatively, a summary of all differences is listed in the left pane. It counts the total different number of all the lines above.

And please note that, the compare is very strict, sometimes, adding a row or a column is necessary.



# Auditing a Configured Router

After the Router 6000 has been configured, it can be audited.

**Why audit?**

There are two reasons to perform a configuration audit.

1. To ensure that all the EDI information was correctly installed on the router.
2. To identify any additional configuration that was performed manually as part of the optimization. You can add this additional configuration to the EDI so that it is up to date.

**Steps**

1. Obtain a *show configuration* text file from the configured router. The *show configuration* command displays all attributes not in the default state
2. Compare this file to the script file that was created from the EDI using RST.

**Tools**

Windows file comparison tools are needed to perform this file comparison because “moved blocks” must be identified. The *show configuration* file and the script file do not have the same sequence. Blocks of CLI commands are identical but appear in different locations in the two files.

Two Windows file comparison tools are described here. They may both be needed since they perform different functions.

1. Winmerge: this is a free tool. It shows in-line changes and moved lines. It performs file or directory comparisons, and can do a merge.

This is the download link:

<http://winmerge.org/downloads/?lang=en>

Here are some alternative file comparison tools:

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

1. Uf.exe: this is a unique file comparison tool. It lists those lines that are unique in each file. This is helpful when identifying moved blocks of CLI commands.



## Winmerge

After installing the Winmerge program on your PC, configure the Winmerge options to view the comparison in the best way.

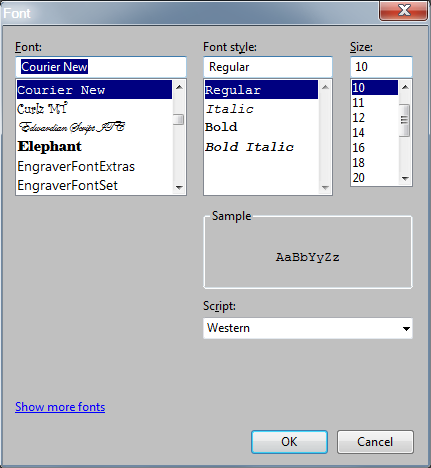
**Font**

View - Select Font

Font: Courier New

Font Style: Regular

Size: 10



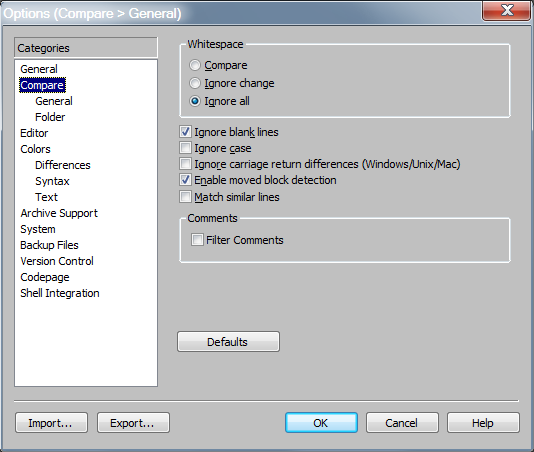
**Options**

Edit - Options - Compare

Whitespace: Ignore all

Ignore blank lines: check

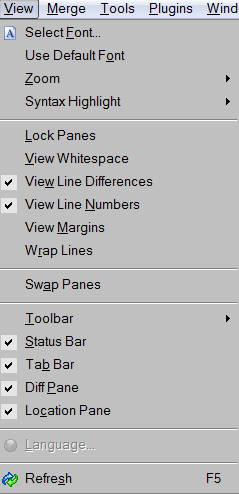
Enable moved block detection: check



**View – Line Numbers**

After the two files are opened, select line numbers.

View - Line Numbers: check



**Steps**

File – Open:

Left: <Original Script File from RST>

Right: <Show configuration file from router>

Winmerge will open a comparison window showing the left and right documents side by side.

**Colors**

Using the default colors, here is what to look for in the comparison window.

White: Exact match. These are ok.

Yellow: Differences. Look for the tan color areas within the yellow blocks.

Tan: Word differences. These should be investigated.

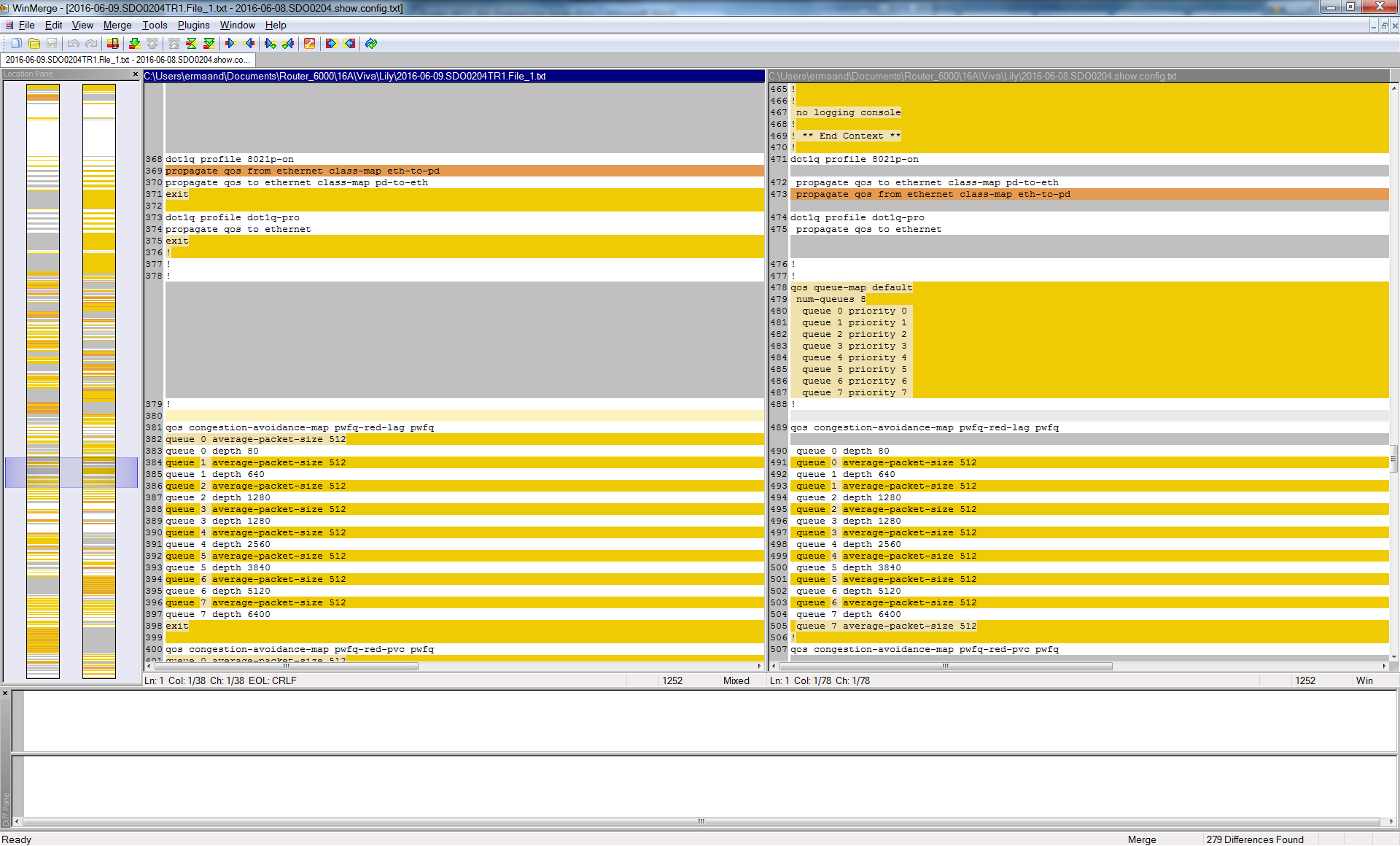
Grey: Deleted lines. Look to see what is opposite the grey area.

Orange: Moved lines. These are ok.

**Example**

In the comparison window example below:

* The line in orange “eth-to-pd” is just moved. So it compares ok.
* The tan lines “qos queue-map default” are word differences. These lines exist only in the *show configuration* file on the right. Since these lines are created by default in the router, we choose to ignore them.
* The “queue N” lines have the queue number highlighted in tan color. Looking more closely we see that is because the depth and the average-packet-size order is reversed. So we choose to ignore these lines.



**Save**

To save the comparison window, print it. If you have Acrobat Professional installed, you can use the print menu to save it as a PDF file.

File – Print – Acrobat

## Unique File tool

Use the Unique File tool to identify command lines that exist in only one file. Investigate each of these lines by looking at the two files, or by looking at the Winmerge output.

**Installation**

Drag the Microsoft Word object above uf.exe into your working folder.

**Execution**

Open a Windows Command Processor.

Start – cmd.exe

Change directory to your working folder.

cd <working folder>

Compare unique lines in each file.

uf <Original Script File from RST> <Show configuration file from router>

**Example**

In the (truncated) example below we can lines that appear in only one file. The output lists unique lines in the script file first and then lists unique lines in the *show configuration* file second. Each unique line should be investigated.

Comparing SDO001TR1.File\_1.txt to SDO001.show.config.txt :

!author: ermaand

!configuration for router: sdo001tr1

!date created: 6/9/2016 3:23:13 pm

!field release: r6k18q2

!file: 1

!project: project1

!router description: tr1

!rst tool version: 1.0.0.78

config

ethernet 0 to qos 0

exit

ip all to qos 0

neighbor 10.0.11.5 password cust-key

…

Comparing SDO001.show.config.txt to SDO001TR1.File\_1.txt :

! configuration last changed by user '%licm%' at wed jun 8 14:23:00 2016

! \*\* end context \*\*

[local]sdo001tr1#show conf

[local]sdo001tr1#show configuration

alarm-port 1 input 1 active low

alarm-port 1 input 1 admin-state disabled

…

# Auto-integration

This section describes how the EDI and RST can provide a Site Basic File for the Auto-integration process.

Limitations for using RST in Auto-integration are highlighted in yellow.

**Initial System Configuration**

The step numbers shown here are taken from CPI “Initial System Configuration”.

**2.2 Configure a Field-Support Account**

The Field Support Account will be created during the integration process. That is:

account: ts\_cde

password: Spitfire12345

AI uses a python script. The user enters the user credentials when running the script.

Remote access (from non-console ports) for the field-support account is enabled during the normal integration process but not during the AI process. This is due to the fact that the command is in exec Command Mode and therefore cannot be used in a script file. The remote access command is recommended and must be executed by the customer after integration.

field-support remote-access enable

**2.4 Configure a Local Administrator Account**

The normal integration process will manually create one administrator account, the first one listed in the EDI table “Administrator Accounts”. At least one administrator account must be created. It must be in the local context, and privilege max must be 15.

For node hardening, it is not recommended that administrator accounts be created by script, but RST will do this nonetheless if they are in the EDI. Otherwise, the customer must create the administrator accounts after AI is complete. For AI, the same recommendations apply.

**2.5 Configure the Ethernet Management Port**

Normal integration uses EDI values to manually configure the Ethernet Management Port, but uses context Local instead of the EDI-listed context. This avoids the overhead of creating a new context.

The step to create the EDI-listed default route is skipped. It is not needed since the only route is to a directly connected PC.

AI will not configure the Ethernet Management Port because the RST script does not generate it. The customer will need to configure the Ethernet Management Port after AI is complete, or leave it unconfigured.

**3.1 Identify the System**

This is performed in the RST script in the same way for ~~Normal integration~~ and AI.

**3.2 Enable Multiple Contexts**

Both Normal integration and RST script files enable Multiple Contexts where necessary.

**3.3 Configure the System Clock**

“Set the clock” is done manually in Normal integration. The timezone is configured via RST script.

For AI, if the customer does not use an NTP server, his clock will not be set.

**3.4 Create System Banners**

This is done via RST script for AI using EDI table “Initial System Configuration”.

**3.5 Modify the TCP Keepalive Parameters**

This is done via RST script for AI using EDI table “Initial System Configuration”.

**3.6 Modify the Maximum Number of Concurrent SSH Sessions**

This is done via RST script for AI using EDI table “Initial System Configuration”.

**3.7 Modify the Duration of the Login Timeout**

This is done via RST script for AI using EDI table “Initial System Configuration”.

**3.8 Modify Session Inactivity Timers**

This is done via RST script AI using EDI table “Initial System Configuration”.

**Licenses**

For AI, the customer must apply the licenses after integration.

**Bulkstats**

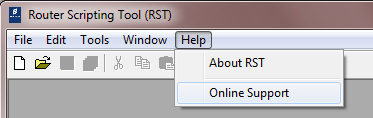
If the Bulkstats feature is used for AI, and it requires a new directory to be created, then it will fail.

# RST Support

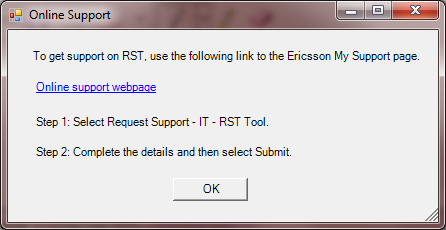
Support for RST defects is requested via the Ericsson “My Support” web page.

**RST – Help – Request Support**

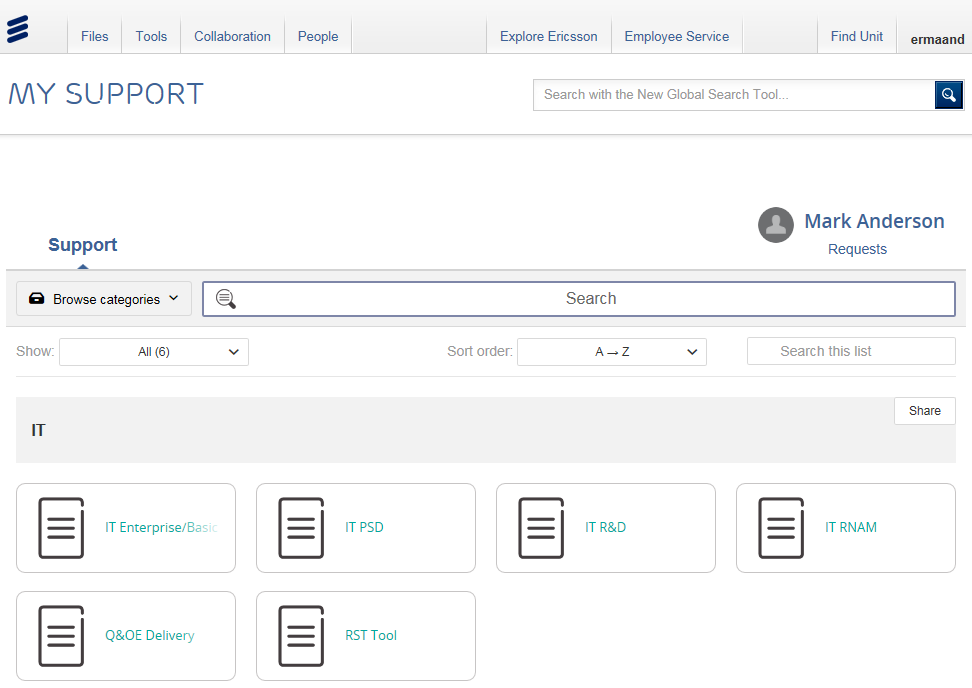
1. Start the RST program on your PC. To start, Start – All Programs – Ericsson – NRO Tools – RST.
2. Help – Online Support.



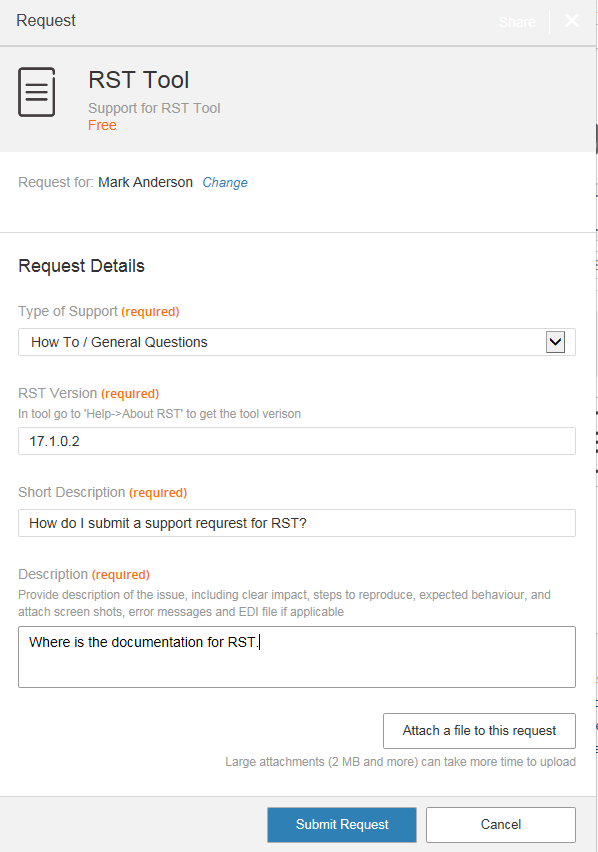
1. Click “Online support webpage”.



1. Navigate to Support – IT – RST Tool or search for “RST”.



1. Complete the form and select “Submit Request”. An email will be sent from “My Support Ericsson SMP” to the Engineering support team.



# EDI Support

To get support for defects in the EDI or Engineering Guide, use the “Suggest a Change” button from the link in CMS. The link in CMS is shown in References. The “Suggest a Change” button is located at the bottom of the page. The screen shot below is taken from release 18A.

