

***TekSIP Route Server***  
**Installation & Configuration Guide**  
**Version 1.3**

## Document Revision 1.9

<https://www.kaplansoft.com/tsrserver/>

TekSIP Route Server is built by Yasin KAPLAN

**Read “Readme.txt” for last minute changes and updates which can be found under application directory.**

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## **Table of Contents**

Table of Contents .....	3
Introduction .....	4
System Requirements .....	4
Installation .....	4
Configuration .....	4
Settings Tab .....	5
Routing .....	6
Application Log .....	6
Starting TekSIP Route Server .....	7
SQL Mode .....	7
Number Portability Application .....	8
Troubleshooting .....	10
Typical Message Flow .....	11
TekSIP Route Server Messages .....	11

## Introduction

TekSIP Route Server is an SIP Redirect Server (*Based on RFC 3261*) runs under Windows (*XP/Vista/7/8/10, 2003-2016 Server*) and can be used as a routing server for a SIP network.

TekSIP Route Server can be run with built-in Microsoft Access database or an external Microsoft SQL Server database. All Microsoft SQL Server editions are supported. TekSIP Route Server also supports ENUM.

## System Requirements

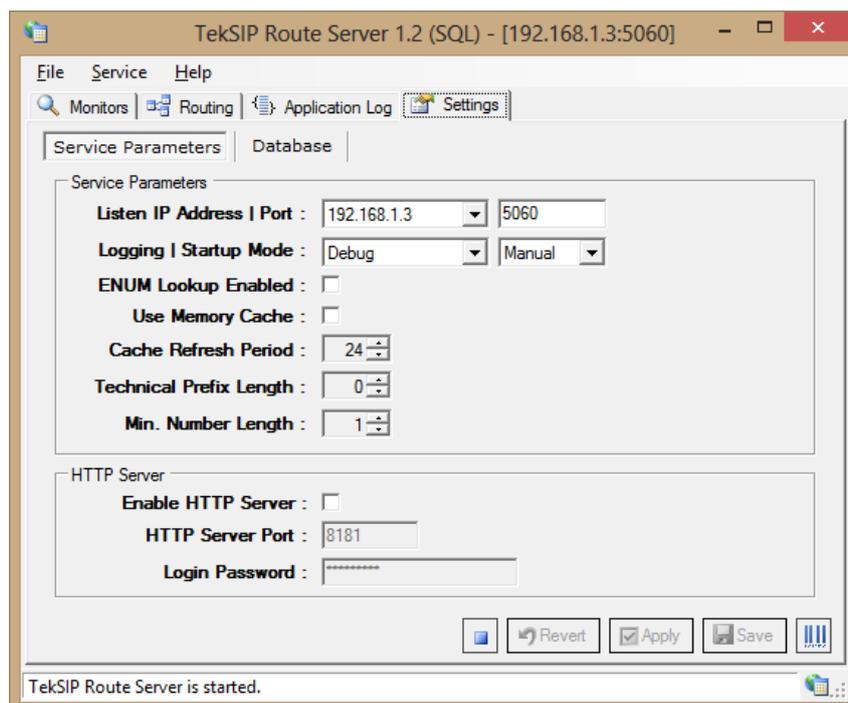
1. A Windows system with at least 2048 MB of RAM.
2. Microsoft.NET Framework 4.0 Client Profile (*Min.*)
3. 10 MB of disk space for installation.
4. Administrative privileges.

## Installation

Unzip “TSRServer.zip” and click “Setup.exe” comes with the distribution. Follow the instruction of setup wizard. Setup will install TekSIP Route Server Manager and TekSIP Route Server Service, add a shortcut for TekSIP Route Server Manager to desktop and the start menu.

## Configuration

Run TekSIP Route Server Manager from Start Menu / Program Files / TekSIP Route Server Manager. TekSIP Route Server automatically configures itself at first run.



**Figure - 1.** TekSIP Route Server Settings tab

## Settings Tab

Click Settings Tab to start configuration. Settings tab has four sub sections. Enter following information:

- **Listen IP Address | Port:** You can select a detected IPv4 address configured on your system. When you change IP configuration of your system, the IP address list will automatically updated. You can define a port number to be listened (*Default 5060*).
- **Logging:** Select logging level of TekSIP Route Server. Select “None” if you do not want logging, select “Errors” to log errors and select “Sessions” to log session information and errors. Log files are located under <Application Directory>\Logs directory.
- **Startup Mode:** Set TekSIP Route Server service startup mode, Manual or Automatic. You can also disable service startup.
- **ENUM Lookup Enabled:** TekSIP Route Server can resolve numbers in incoming SIP requests to an ENUM entry if exists. If TekSIP Route Server cannot find a valid entry in routing table, TekSIP Route Server will perform an ENUM query. If a valid ENUM entry found for the dialed number, it is returned in a 302 response to originating endpoint by TekSIP Route Server. e164.arpa domain used is used in queries.
- **Use Memory Cache:** You can keep query result in memory to provide faster responses to subsequent queries. *This feature is available in commercial edition.*
- **Memory Cache Refresh Period:** TekSIP Route Server will clear memory cache in periods specified in this parameter.
- **RegEx Based Matching:** TekSIP Route Server can perform regular expression matching if SQL database is used. This option is not available when built in database used. RegEx Based Matching is supported in only commercial edition.

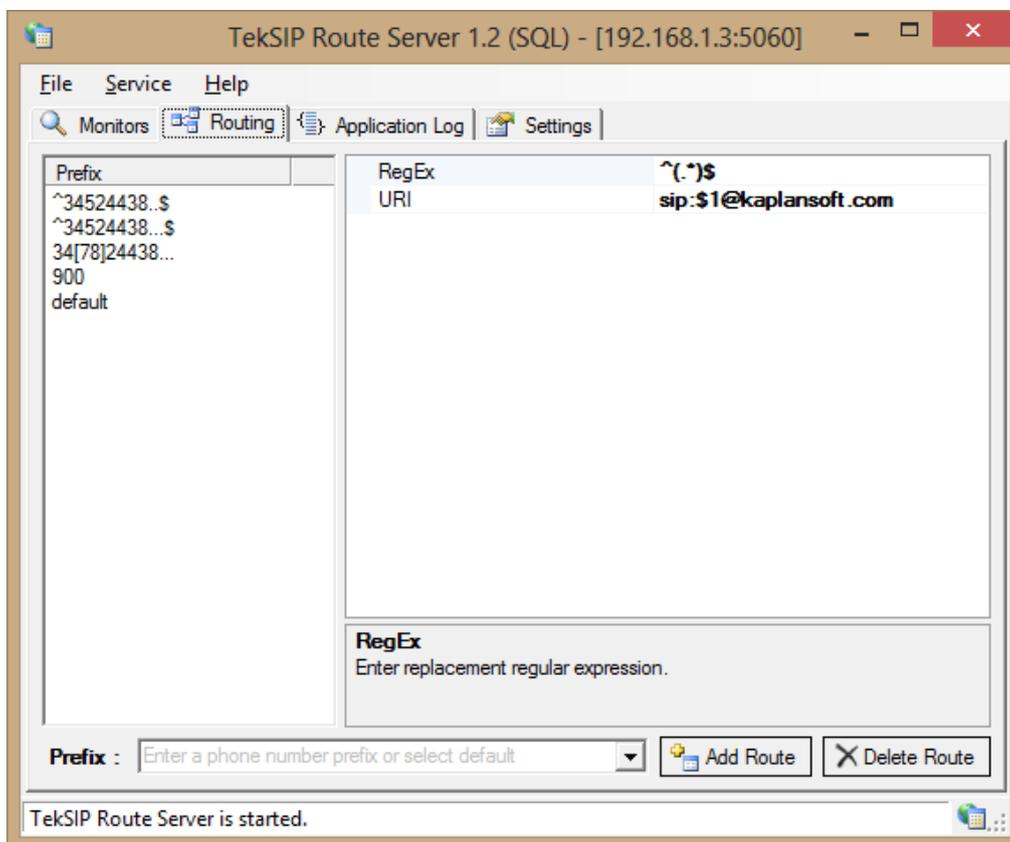


Figure - 2. Routing Tab

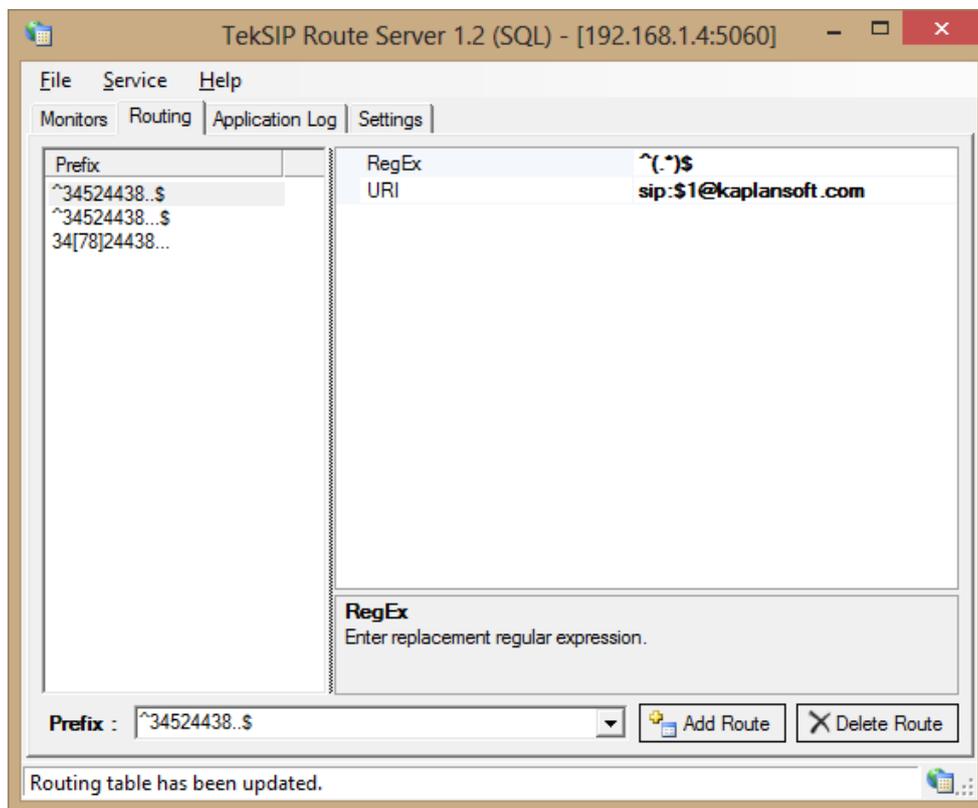
## Routing

You can define resource records or routes for a particular E.164 number or a prefix in “Routing” tab. Enter a phone number prefix to bottom leftmost textbox and click “Add Route” button.

You can have also a default route entry. TekSIP Route Server chooses longest match prefix route. If any match cannot be found default route is chosen if exists. You can have just one record per prefix or per E.164 entry.

Enter a prefix and click “Add Route” button to add a new routing entry. You must edit at least URI entry to commit changes.

You can specify Regular Expressions in place of plain number prefixes if RegEx Based Matching enabled.

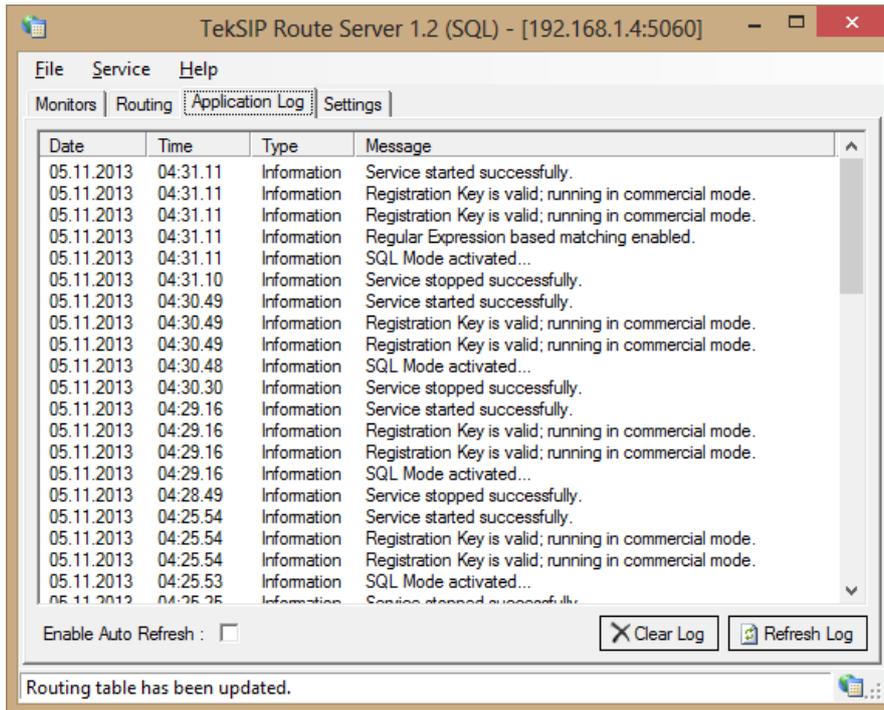


**Figure - 3.** RegEx Prefix definitions in Routing Tab

If you use RegEx based matching for route entries and your SQL server is not located in the same server with TSRServer you need to create a directory in the SQL server system with same name that is created for TSRServer under Program Files directory and copy ClrFunctions.dll which can be found in TSR Server application directory. TSRServer creates necessary object in the SQL server for performing RegEx matching in the SQL server which requires sa privileges.

## Application Log

You can monitor system events in Application Log tab. You can manually refresh log entries and clear log entries. Click Enable Auto Refresh option to refresh log list every seconds.



**Figure - 4.** Application Log Tab

## Starting TekSIP Route Server

Click “Service” menu and select “Start” to run TekSIP Route Server after making necessary configuration and saving configuration. If service starts successfully you will see “TekSIP Route Server is started” message at bottom left message section of TekSIP Route Server Manager. Optionally you can start/stop TekSIP Route Server using the button on Settings tab. When you make any change(s) in configuration, TekSIP Route Server will ask you if you wish to restart TekSIP Route Server to make settings changes active if TekSIP Route Server service is running.

If TekSIP Route Server service cannot start please examine Application Log tab as well as TekSIP Route Server log file under <Application Directory>\Logs if you were enabled logging in Settings tab.

## SQL Mode

TekSIP Route Server uses built-in Microsoft Access database by default. If you plan to use a Microsoft SQL Server database, create database and “Routes” table using TSRSDb.sql and Routes.sql scripts respectively. These scripts can be found TekSIP Route Server application directory. You need to add flowing section and parameters for SQL mode operation to TSRServer.ini which can be found under TekSIP Route Server application directory;

```
[Database]
SQL_Server=<IP Address of the SQL Server>
Catalog=TSRSDB
Table=<Table which holds routing entries>
UserName=<Database username, sa e.g.>
Password=<Database user password>
Timeout=30
```

You can optionally add `SelectClause` parameter to define an alternative SQL query under `[Database]` section of `TSRServer.ini`. For example;

```
SelectClause=EXECUTE getroute 'N%number%'
```

TekSIP Route Server will replace `% number %` variable with queried E.164 address. TekSIP Route Server invokes stored procedure `getroute` in this sample. If you use a view or a stored procedure, returned record structure must be in following format;

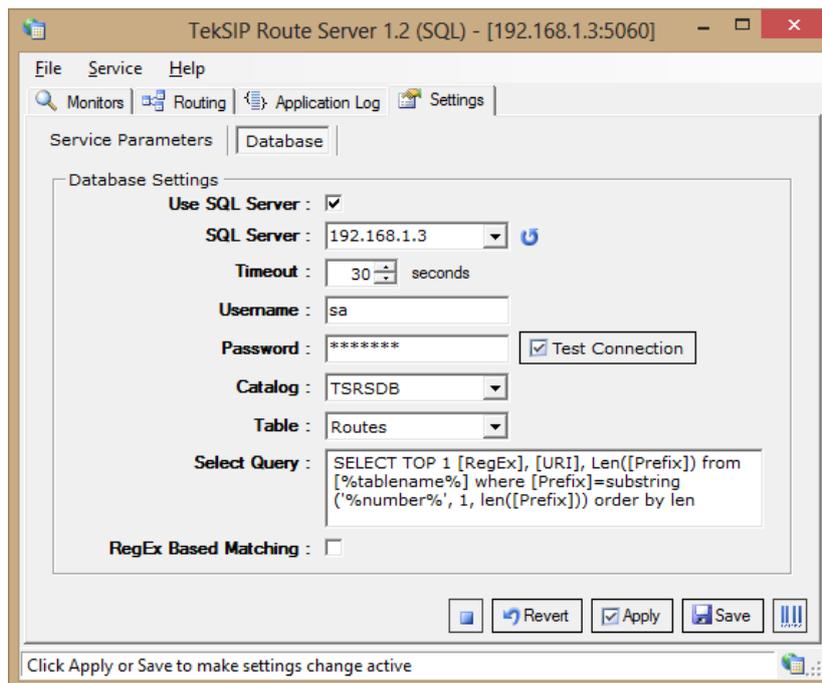
```
CREATE TABLE [dbo].[Routes](
    [Prefix] [nvarchar](255) NOT NULL,
    [RegEx] [nvarchar](255) NULL,
    [URI] [nvarchar](255) NULL
) ON [PRIMARY]
```

Default select clause is;

```
SELECT TOP 1 [RegEx], [URI] from [Routes] where [Prefix]=substring('%number%',
1, len([Prefix])) order by len([Prefix]) desc
```

Re-start TekSIP Route Server service after adding these parameters.

You can also use TekSIP Route Server GUI for SQL connection settings;



**Figure - 5.** Database Settings Tab

## **Number Portability Application**

TekSIP Route Server can be deployed as route server for Local or Mobile Number Portability applications. TekSIP Route Server is located between session border controller which provides interface to interconnecting carriers and end users, and operator's NGN network. Calls are routed TekSIP Route Server first, and if the number is ported to another operator a SIP 302 response which contains prefix of the host operator of the ported number will be sent to originating SBC.

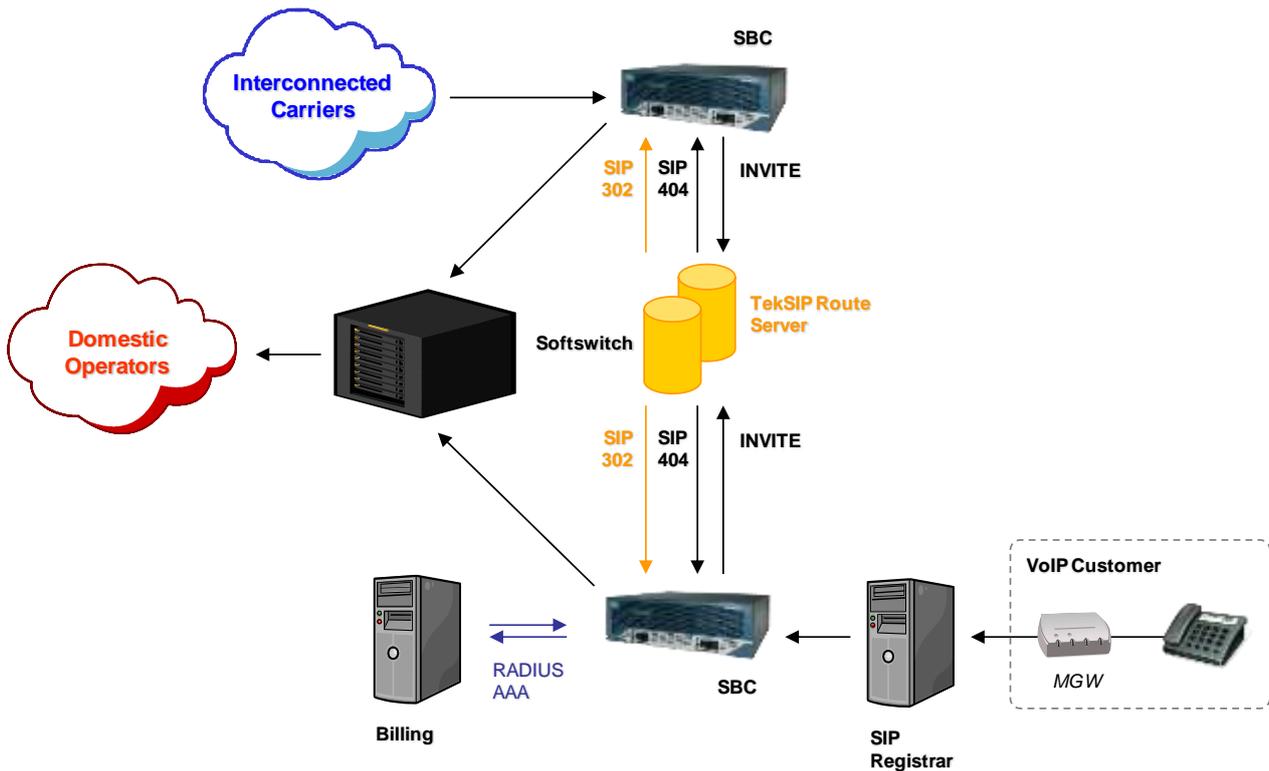


Figure - 5. Number Portability Application Network Diagram

If called number is not ported, NP Server will reply with a SIP 302 response which contains prefix of the home operator of the called number will be sent to originating SBC. SBC will route the call to the number specified in Contact header of SIP 302 response.

Typical SBC configuration is shown below (Cisco):

```
dial-peer voice 10 voip
description -- Outgoing 1 --
destination-pattern 05T
session protocol sipv2
preference 1
session target ipv4:<TekSIP Route Server IP Address>:5060
!
dial-peer voice 20 voip
description -- Outgoing 2 -
! for Carriers
! destination-pattern <carrier code>T
destination-pattern .+
session protocol sipv2
session target ipv4:<SoftSwitch IP Address>:5060
!
```

Dial-Peer 10 forwards calls to TekSIP Route Server and Dial Peer 20 routes calls to Softswitch according to the TekSIP Route Server response.

## Troubleshooting

TekSIP Route Server provides many messages when problems occur. You can see error messages on TekSIP Route Server Status bar or in the log file of TekSIP Route Server service. You can enable logging in Settings Tab. There are three levels of logging; None, Errors, Sessions. If you select Errors, TekSIP Route Server logs just error messages. If you select Sessions both Session and Error messages will be logged. You have to save or apply settings changes if you change logging level setting. Log files are located under <Application Directory>\Logs directory.

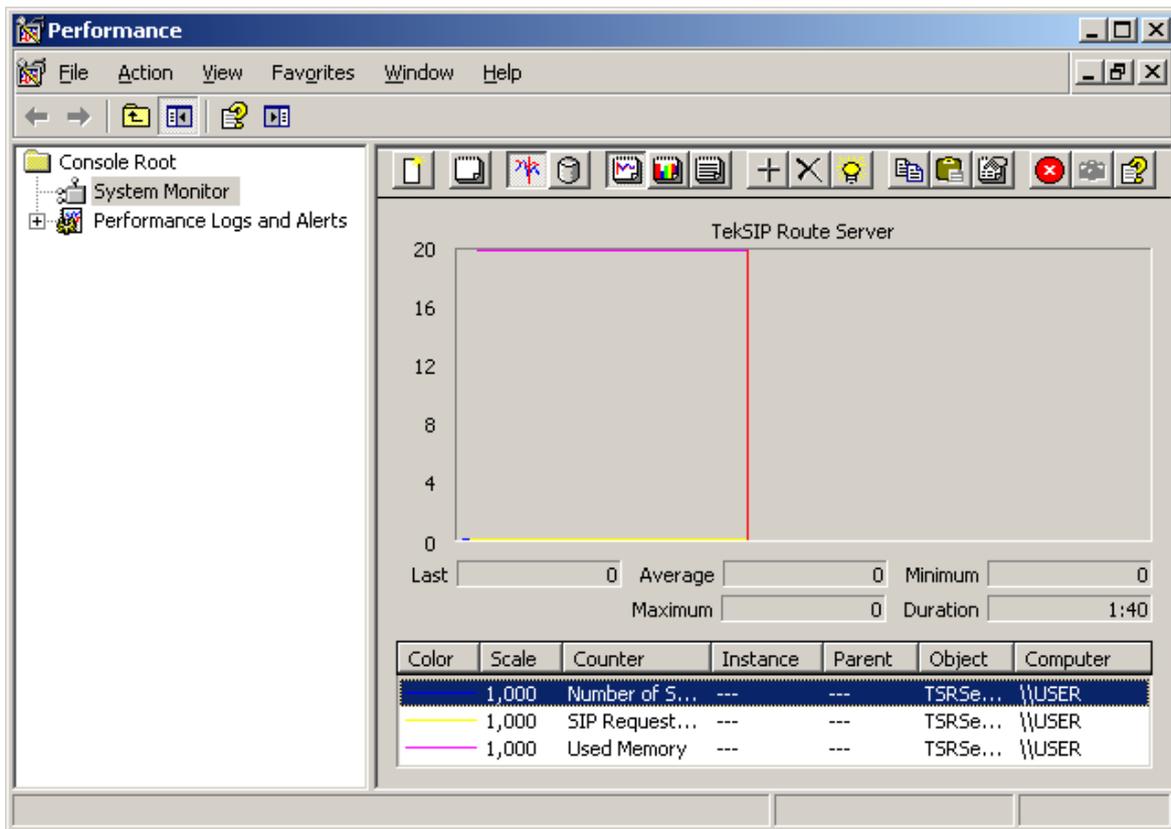


Figure - 4. TekSIP Route Server counters on Windows Performance Monitor

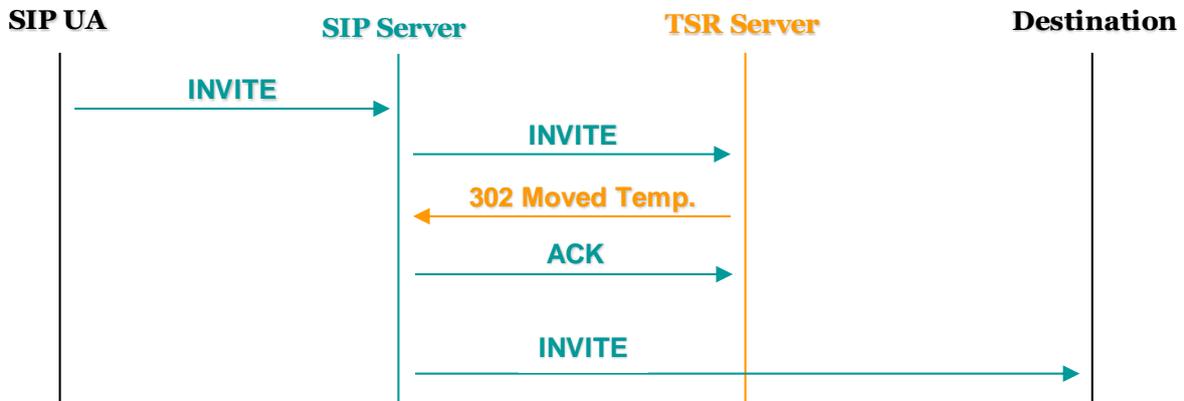
TekSIP Route Server also utilizes Windows Performance Monitor providing numerous counters;

- Used Memory
- Number of Items in Memory Cache
- Number of SIP Requests Received
- SIP Requests Receive Rate
- Number of Successful Processed SIP Requests
- Number of Replies from Memory Cache
- Number of Failed SIP Requests

You can add and monitor them using Windows Performance Monitor (*Perfmon.exe*). You can also monitor these counters through TekSIP Route Server Manager and web monitoring interface.

## Typical Message Flow

TekSIP Route Server returns 302 responses for located SIP destinations. If a route cannot be located for an incoming SIP call, a 404 response will be returned.



## TekSIP Route Server Messages

**TekSIP Route Server started. Listening on x.x.x.x.**

This message notifies that TekSIP Route Server service is started.

**Listened IP Address is being changed from x.x.x.x to y.y.y.y.**

TekSIP Route Server has detected a change in system's IP configuration and automatically changed listened IP address. You might change or remove the IP address configured for listening.

**Settings could not be loaded. Initializing with default values.  
TekSIP Route Server Service is being started with default values on :  
x.x.x.x**

You get this message at first run of TekSIP Route Server. If TekSIP Route Server can not find or read TSRServer.ini initialize itself with default settings.

**Unable to initialize UDP thread [x.x.x.x:5060]**

If another application is configured to use same UDP port (53) with TekSIP Route Server, TekSIP Route Server can not initialize UDP service thread. Please also check if a SIP server is running on the same machine.

**Can not apply changes; enter minimum configuration**

There is missing configuration data.