Zabbix – Distribution system and Time Base Correlation

Modules and extensions for Zabbix from S&T Slovakia

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Agenda

1. Distribution system
2. Time Base Correlation

1| Distribution system

Purpose

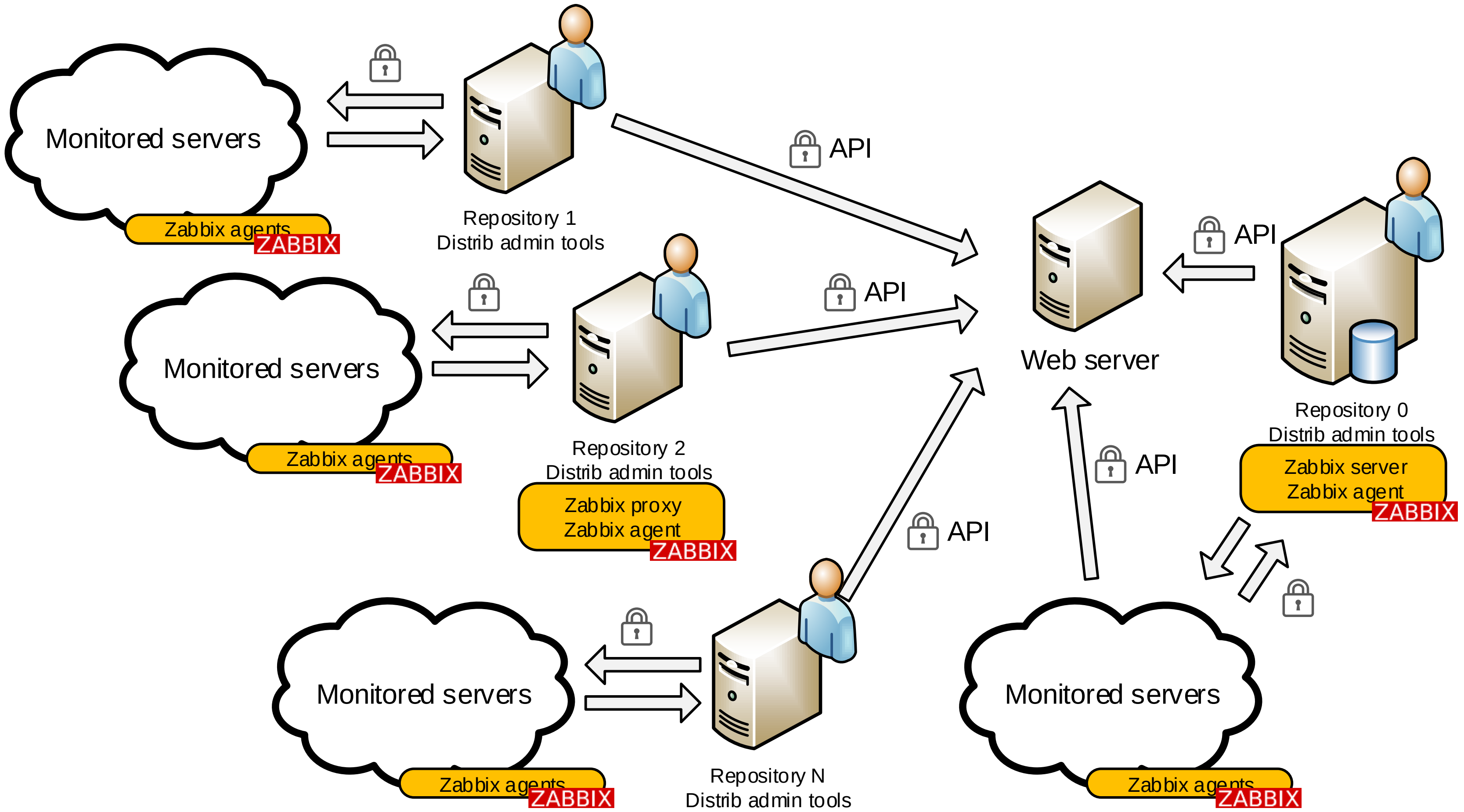
Remote Zabbix agent and Zabbix proxy management:

- Restart Zabbix agent and Zabbix proxy
- Zabbix proxy update
- Zabbix Agent and Zabbix proxy status identification
- View the contents of Zabbix agent configuration files
- Listing Zabbix agent distribution directory

Zabbix agent configuration repositories

Distribution of Zabbix agent configuration files, monitoring scripts, and binary files

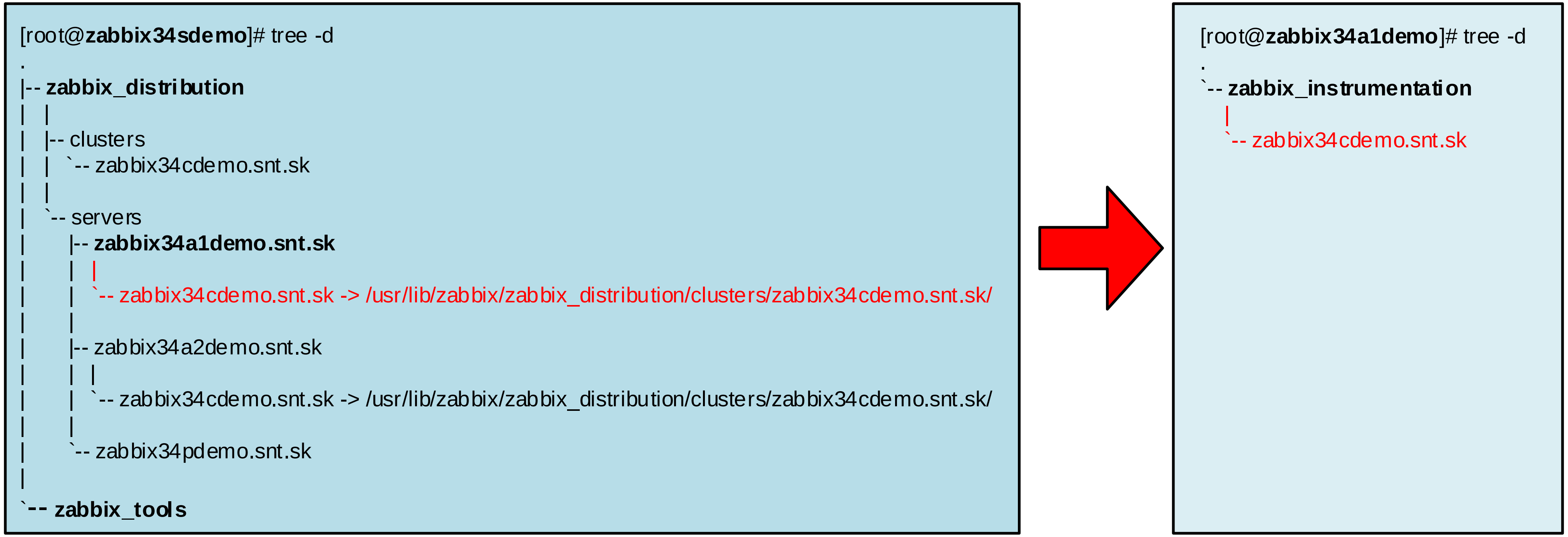
Architecture



Architecture – important features

Unlimited repositories
The repository can be located on any server (Zabbix server, Zabbix proxy, dedicated server ...)
There is no need to create a new account on the monitored server
There is no need to open any port to the monitored server (except Zabbix agent port)
There is no SSH connection to the monitored server
Distribution system uses Zabbix agents on monitored servers only
The distribution system is designed for heterogeneous environments – HPUX, Solaris, AIX, Linux, MS Windows
Distribution system tools collect information about monitored servers using the Zabbix DB Zabbix API
Each monitored server has its own repository directory with all configuration files, scripts and binaries
rsync is used to synchronize the contents of distribution directories
Distribution system tools work with separate servers and clusters

Directory structure



Repository

```
[root@zabbix34sdemo]# tree -d
.
|-- zabbix_distribution
|   |
|   |-- clusters
|   |   `-- zabbix34cdemo.snt.sk
|   |
|   `-- servers
|       |-- zabbix34a1demo.snt.sk
|       |   |
|       |   `-- zabbix34cdemo.snt.sk -> /usr/lib/zabbix/zabbix_distribution/clusters/zabbix34cdemo.snt.sk/
|       |
|       |-- zabbix34a2demo.snt.sk
|       |   |
|       |   `-- zabbix34cdemo.snt.sk -> /usr/lib/zabbix/zabbix_distribution/clusters/zabbix34cdemo.snt.sk/
|       |
|       `-- zabbix34pdemo.snt.sk
|
`-- zabbix_tools
```

Monitored server

```
[root@zabbix34a1demo]# tree -d
.
`-- zabbix_instrumentation
    |
    `-- zabbix34cdemo.snt.sk
```

Administrator tools

`zabbix_agent_conf.pl`	view the contents of Zabbix agent configuration files on monitored servers
`zabbix_agent_deploy.pl`	deploying distribution directory contents to monitored servers
`zabbix_agent_distrib_dir.pl`	view the contents of distribution directories on monitored servers
`zabbix_agent_restart.pl`	Zabbix agent restart
`zabbix_agent_status.pl`	Zabbix agent activity status
`zabbix_agent_stop.pl`	Zabbix agent stop

`zabbix_cluster_deploy.pl`	deploying distribution directory contents to monitored clusters
`zabbix_cluster_restart.pl`	Zabbix agents restart on monitored clusters

`zabbix_proxy_restart.pl`	Zabbix proxy restart
`zabbix_proxy_start.pl`	Zabbix proxy start
`zabbix_proxy_status.pl`	Zabbix proxy status
`zabbix_proxy_stop.pl`	Zabbix proxy stop
`zabbix_proxy_update.pl`	Zabbix proxy update

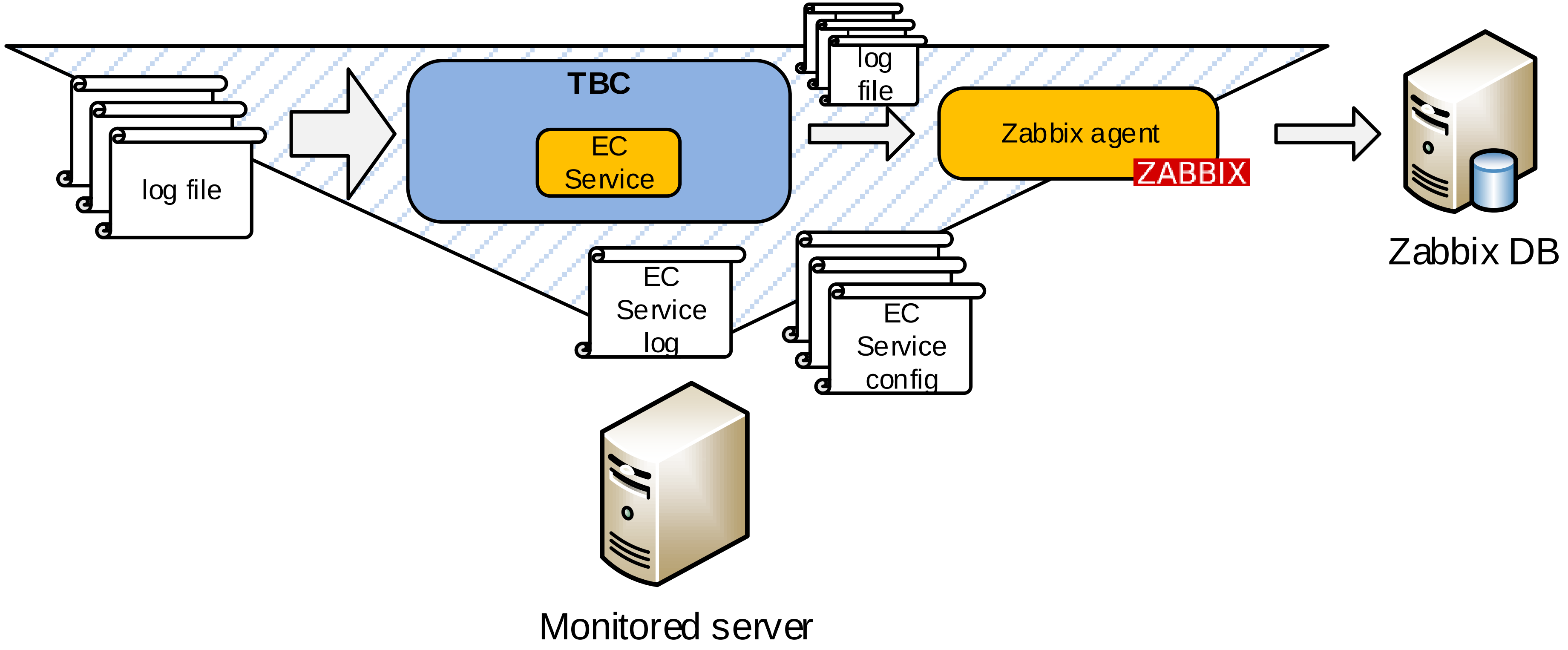
The tools are located on the repository servers
The use of the tools is very simple - they have only one argument (server or cluster name)
It is very easy to create additional tools with our supplied perl module
S&T also supplies additional tools as part of its modules and extensions (eg TBC)

2| Time Base Correlation

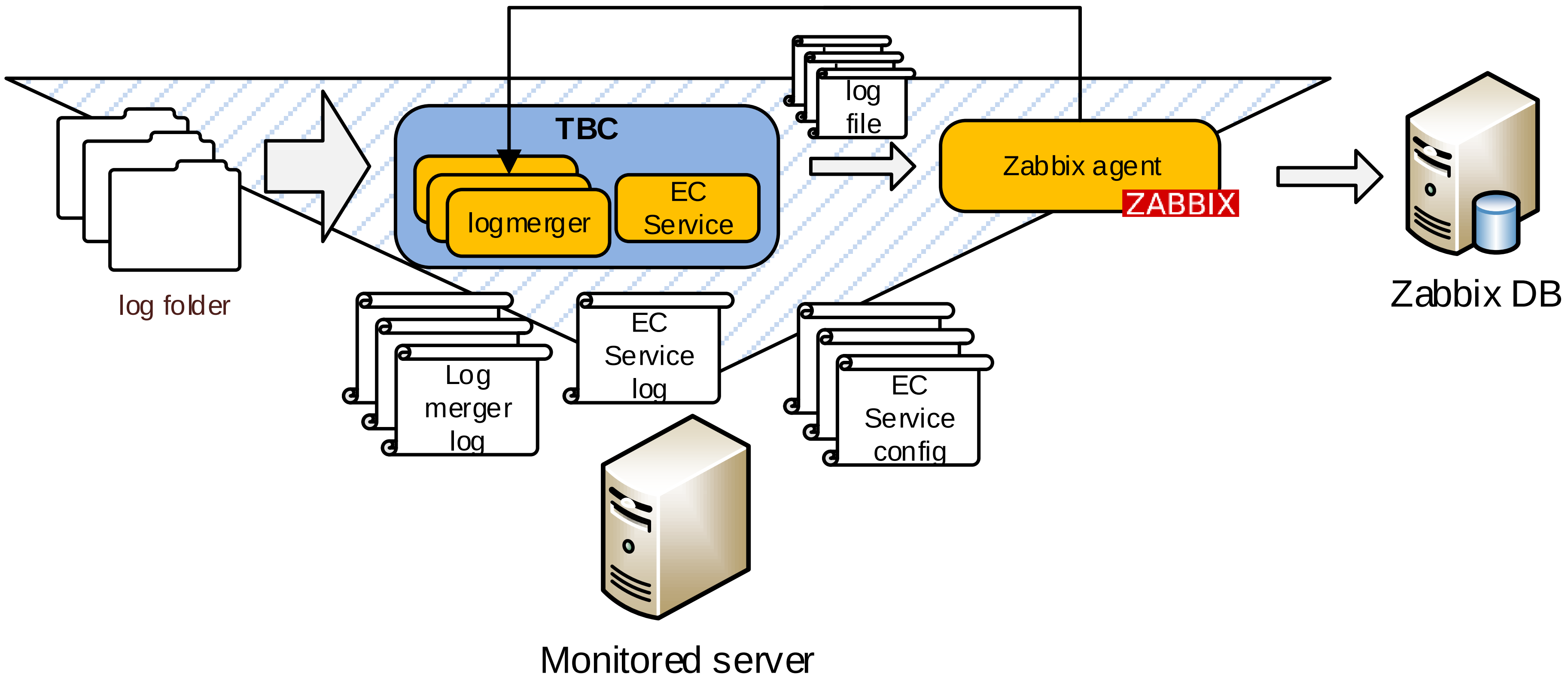
Purpose

Processing SNMP traps, specific log files, directories with log files, and log files with multiline record type
The content of the processed directories may vary over time and it is possible to select log files using a regular expression identifying their name
The content of the files is processed by Event correlation service
The correlation engine is configurable and allows to reduce the stream of records processed by Zabbix agent or Zabbix proxy
TBC processing takes place on servers with Zabbix agent or Zabbix proxy
Linux and Unix OS are supported

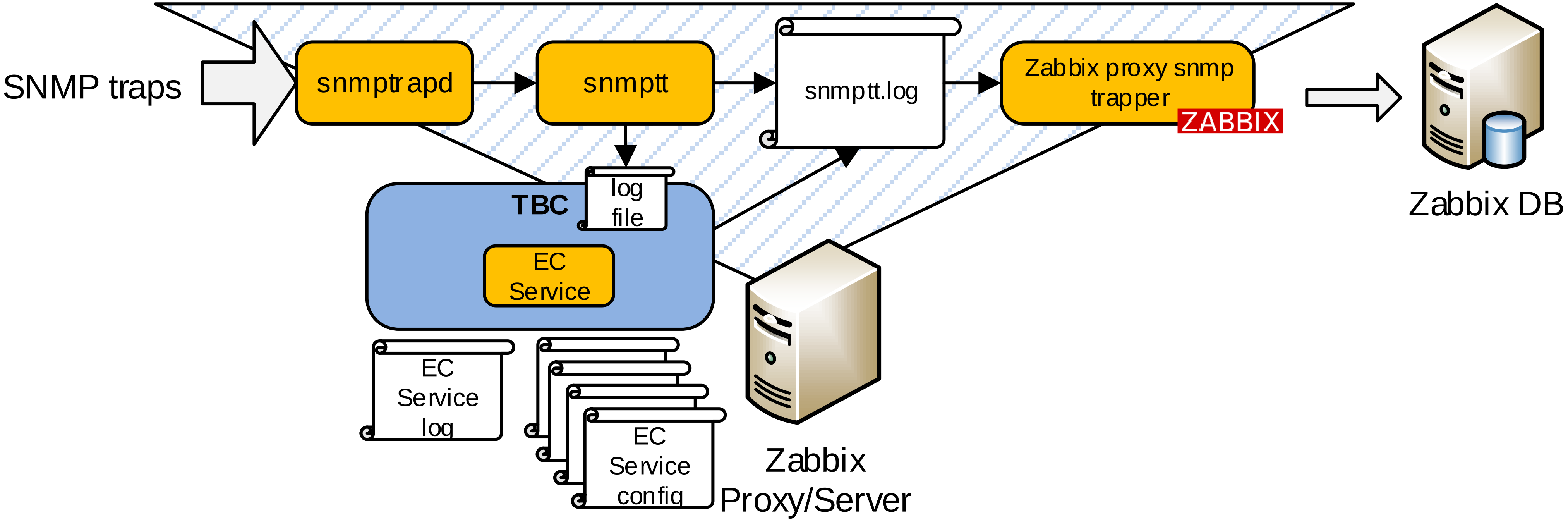
Architecture – specific log file processing



Architecture – directory processing



Architecture – SNMP trap processing

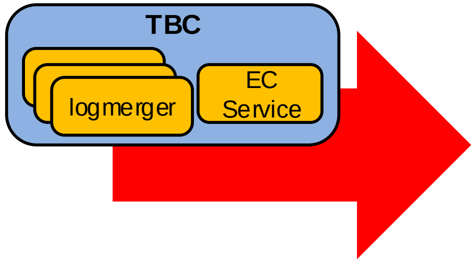


TBC – directory and file structure

Examples of processed log files and directories

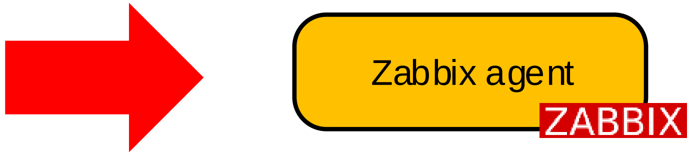
/var/log/demo/

```
.
|-- demo3.log
|-- directory
|   |-- test1.log
|   |-- test10.log
|   |-- test17.log
|   |-- test18.log
|   |-- test19.log
|   |-- test2.log
|   |-- test20.log
|   |-- test22.log
|   |-- test3.log
|   |-- test4.log
|   |-- test5.log
|   |-- test6.log
|   |-- test7.log
|   |-- test8.log
|   `-- test9.log
`-- directory_ml
    |-- test1.log
    |-- test2.log
    `-- test3.log
```



/var/log/zabbix/tbc

```
.
|-- TBC_demo3.log
|-- TBC_directory.log
|-- TBC_directory_ml.log
|-- directory.log
`-- directory_ml.log
```



Logmerger and EC Service

TBC

Logmerger singl line and multi line (sl/ml)

Perl scripts created by S&T
Cyclically Started by Zabbix agent - one instance per directory
Processing the source log:

- always from the beginning
- from the beginning for the first entry only
- from the first entry point

Event storm protection Storm
Number of processed lines per cycle
Directory definition
Initial line identifications with regular expressions (ml)
Defining the linking string (ml)
Maximum output line length (ml)
Defining the output file
Self monitoring – processing error log files

EC service

Perl script – Simple Event Correlator
Runs as a service
Correlators - configuration files for each log or directory
Processing the source log:

- always from the beginning
- from the beginning for the first entry
- from the first entry point

Defining input and output files
Self monitoring - defining and processing error log files

Correlators for EC

S&T supplies three basic correlators for EC:

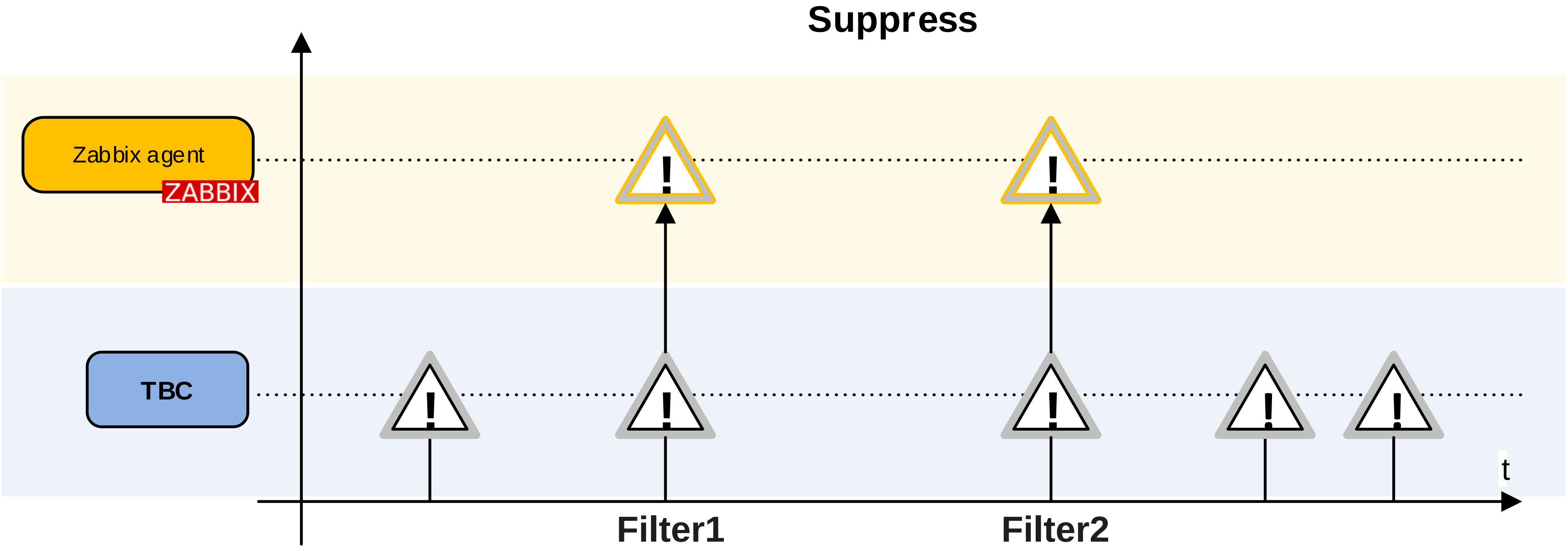
- Suppress
- Counter
- Timer

Correctors are provided in two modes of operation:

- Source mode
- Condition mode

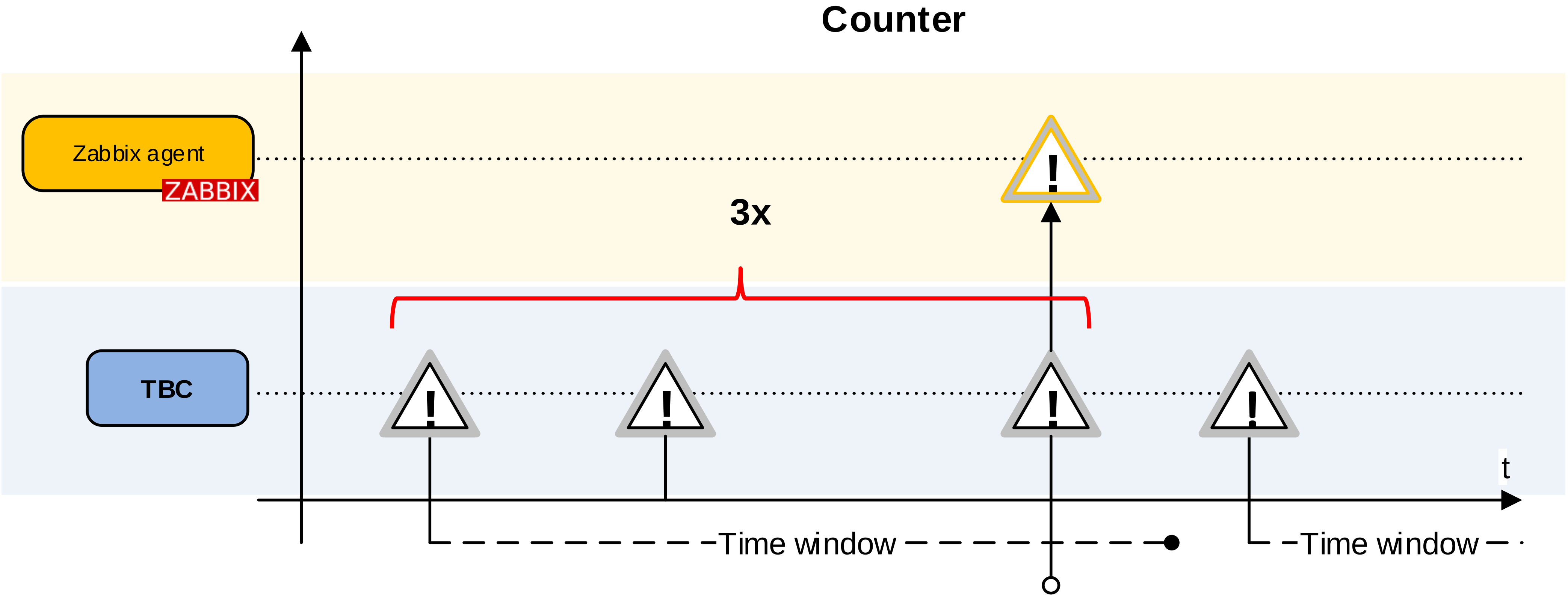
The concept of correlators and modes is explained in the following slides

Suppress correlator



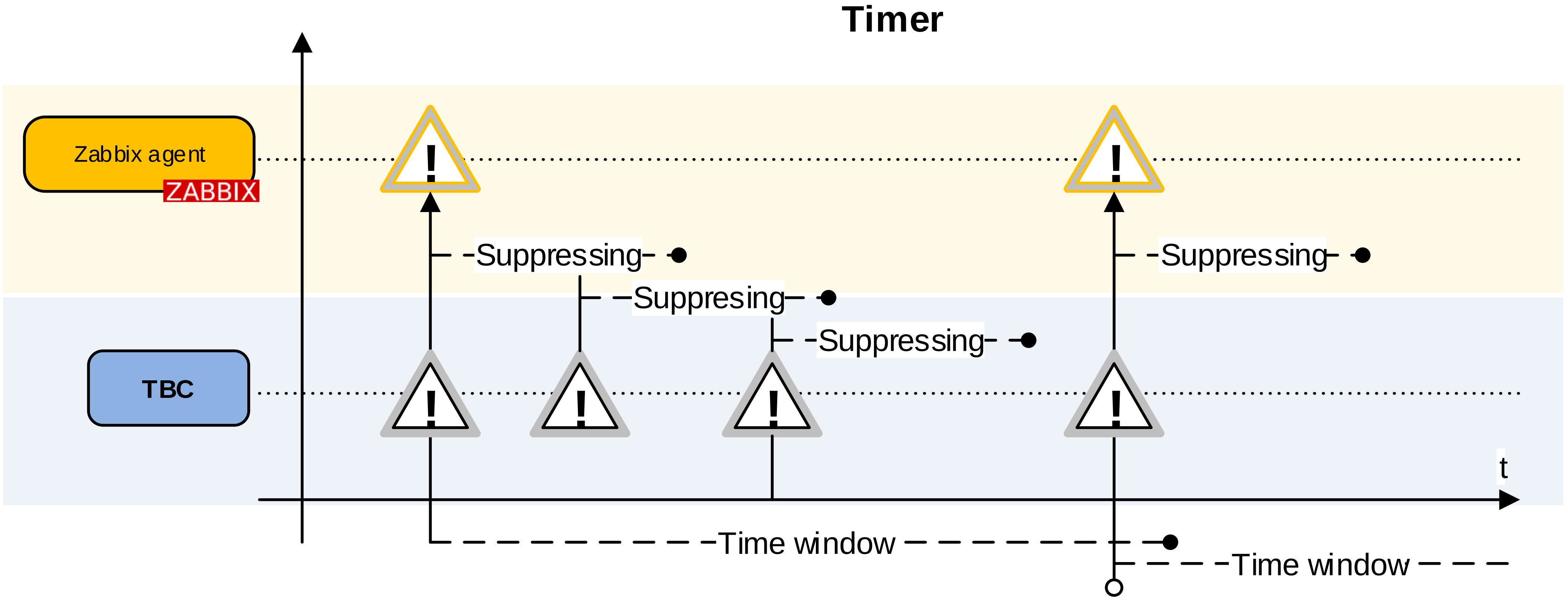
It is possible to create a number of filters with chained logical conditions

Counter correlator



The picture presents Counter 3x correlator.

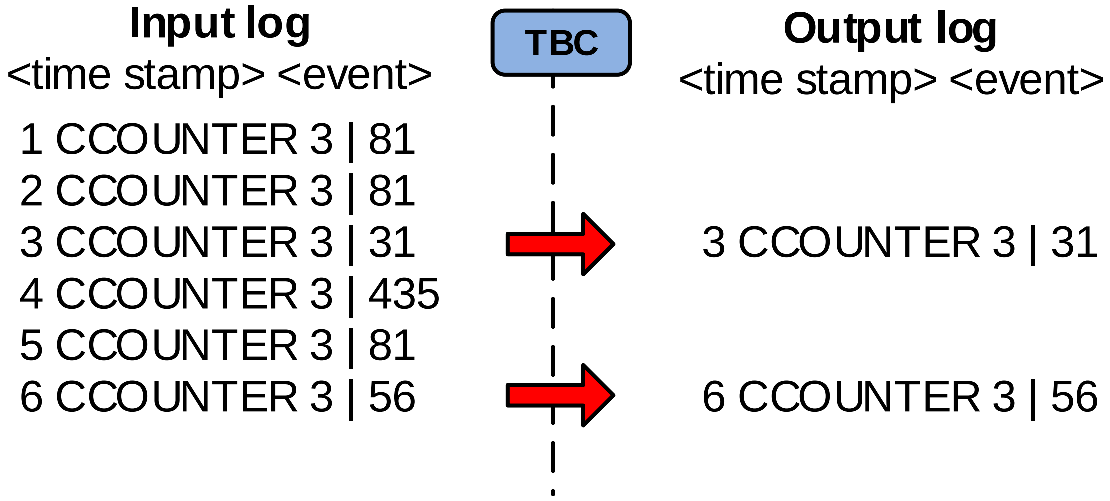
Timer correlator



Counter correlator - Condition mode example

Counter 3x, 1h

Condition match



Input log
<time stamp> <event>

```
1 CCOUNTER 3 | 81
2 CCOUNTER 3 | 81
3 CCOUNTER 3 | 31
4 CCOUNTER 3 | 435
5 CCOUNTER 3 | 81
6 CCOUNTER 3 | 56
```

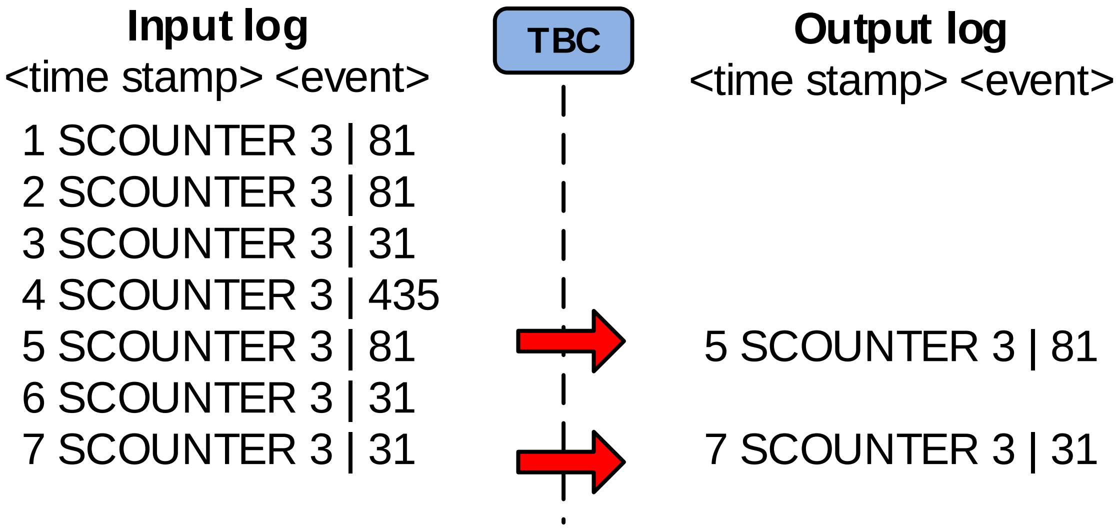
Output log
<time stamp> <event>

```
3 CCOUNTER 3 | 31
6 CCOUNTER 3 | 56
```

Counter correlator - Source mode example

Counter 3x, 1h

Source match



Input log

<time stamp> <event>

```
1 SCOUNTER 3 | 81
2 SCOUNTER 3 | 81
3 SCOUNTER 3 | 31
4 SCOUNTER 3 | 435
5 SCOUNTER 3 | 81
6 SCOUNTER 3 | 31
7 SCOUNTER 3 | 31
```

Output log

<time stamp> <event>

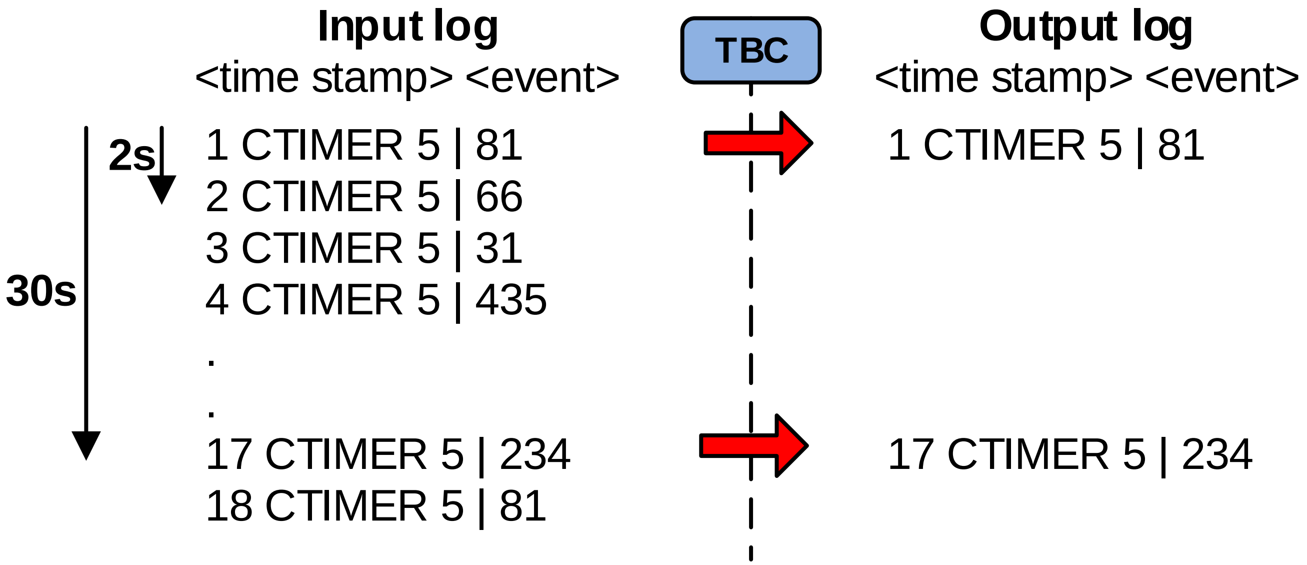
```
5 SCOUNTER 3 | 81
7 SCOUNTER 3 | 31
```

Only one rule for all source variations!

Timer correlator - Condition mode example

Timer 5s, 30s

Condition match



Input log

<time stamp> <event>

```
1 CTIMER 5 | 81
2 CTIMER 5 | 66
3 CTIMER 5 | 31
4 CTIMER 5 | 435
.
.
17 CTIMER 5 | 234
18 CTIMER 5 | 81
```

Output log

<time stamp> <event>

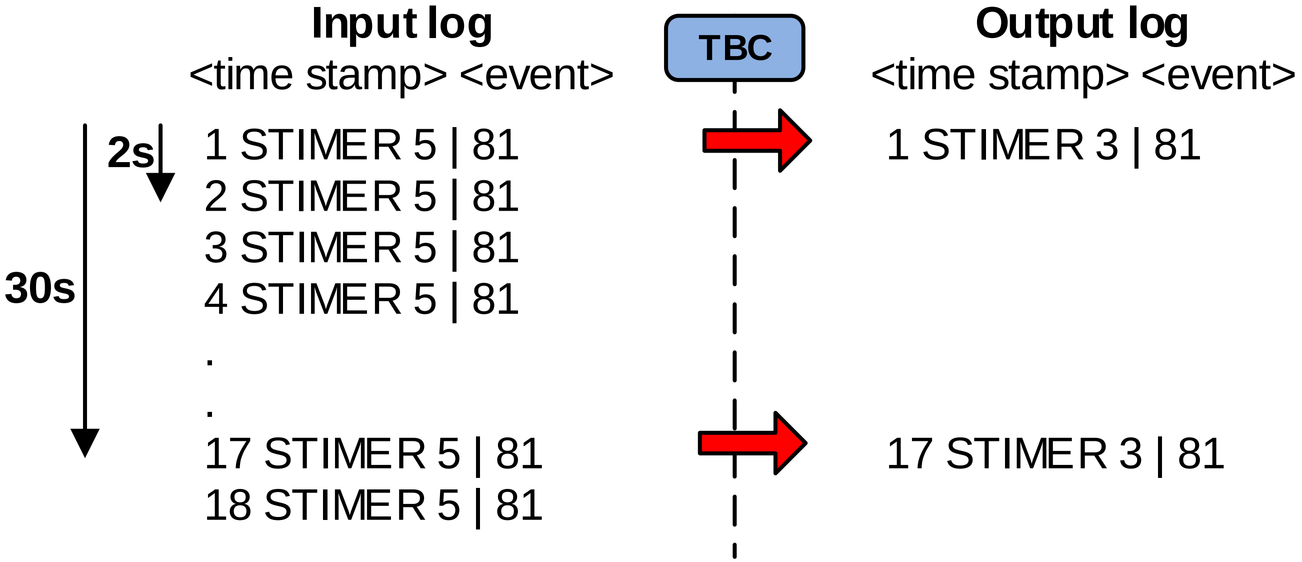
```
1 CTIMER 5 | 81

17 CTIMER 5 | 234
```

Timer correlator - Source mode example

Timer 5s, 30s

Source match



Input log
<time stamp> <event>

```
1 STIMER 5 | 81
2 STIMER 5 | 81
3 STIMER 5 | 81
4 STIMER 5 | 81
.
.
17 STIMER 5 | 81
18 STIMER 5 | 81
```

Output log
<time stamp> <event>

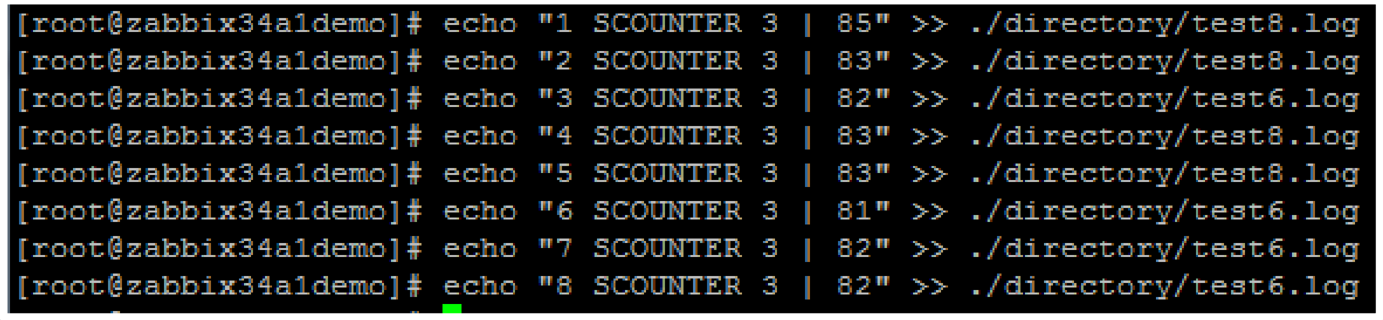
```
1 STIMER 3 | 81
17 STIMER 3 | 81
```

Only one rule for all source variations!

Simulation for Counter 3x correlator (Source mode)

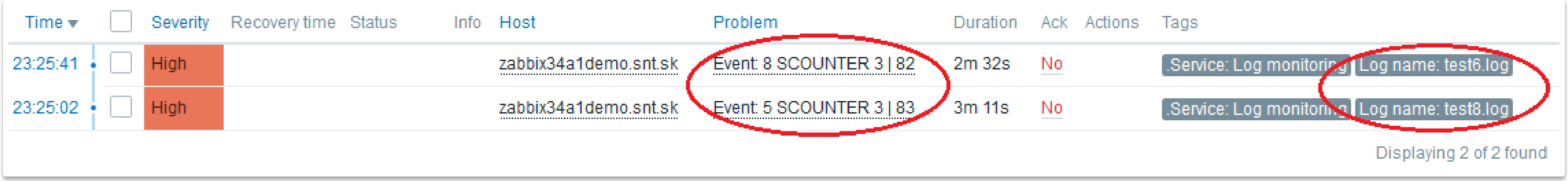
1) **./directory** is empty

2) creating and filling log files:



```
[root@zabbix34a1demo]# echo "1 SCOUNTER 3 | 85" >> ./directory/test8.log
[root@zabbix34a1demo]# echo "2 SCOUNTER 3 | 83" >> ./directory/test8.log
[root@zabbix34a1demo]# echo "3 SCOUNTER 3 | 82" >> ./directory/test6.log
[root@zabbix34a1demo]# echo "4 SCOUNTER 3 | 83" >> ./directory/test8.log
[root@zabbix34a1demo]# echo "5 SCOUNTER 3 | 83" >> ./directory/test8.log
[root@zabbix34a1demo]# echo "6 SCOUNTER 3 | 81" >> ./directory/test6.log
[root@zabbix34a1demo]# echo "7 SCOUNTER 3 | 82" >> ./directory/test6.log
[root@zabbix34a1demo]# echo "8 SCOUNTER 3 | 82" >> ./directory/test6.log
```

3) Zabbix problems:



Time ▾	□	Severity	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	Tags
23:25:41	□	High				zabbix34a1demo.snt.sk	Event: 8 SCOUNTER 3 | 82	2m 32s	No		Service: Log monitoring Log name: test6.log
23:25:02	□	High				zabbix34a1demo.snt.sk	Event: 5 SCOUNTER 3 | 83	3m 11s	No		Service: Log monitoring Log name: test8.log

Displaying 2 of 2 found

Only one correlator, item and trigger is needed for all log files in a directory and all event variations!

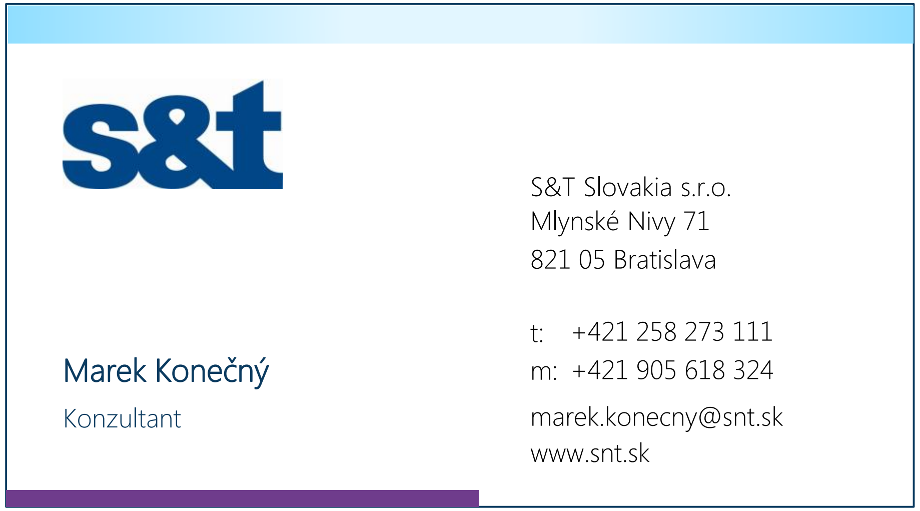
Correlation possibilities

Detection of event sequences over time
Time-dependent filtering
Time-dependent validity of correlation rules
Conditional suppression – chaining rules
Generators of synthetic events
Postprocessing events
...

TBC tools for Distribution system

`zabbix_agent_deploy.pl`	deploying configuration files with correlators to monitored servers
`zabbix_tbc_start.pl`	EC service start
`zabbix_tbc_status.pl`	EC service status check
`zabbix_tbc_stop.pl`	EC service stop

Contact



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