

Transaction Analysis & Performance Evaluation

Application end-to-end monitoring full compliant



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Why?

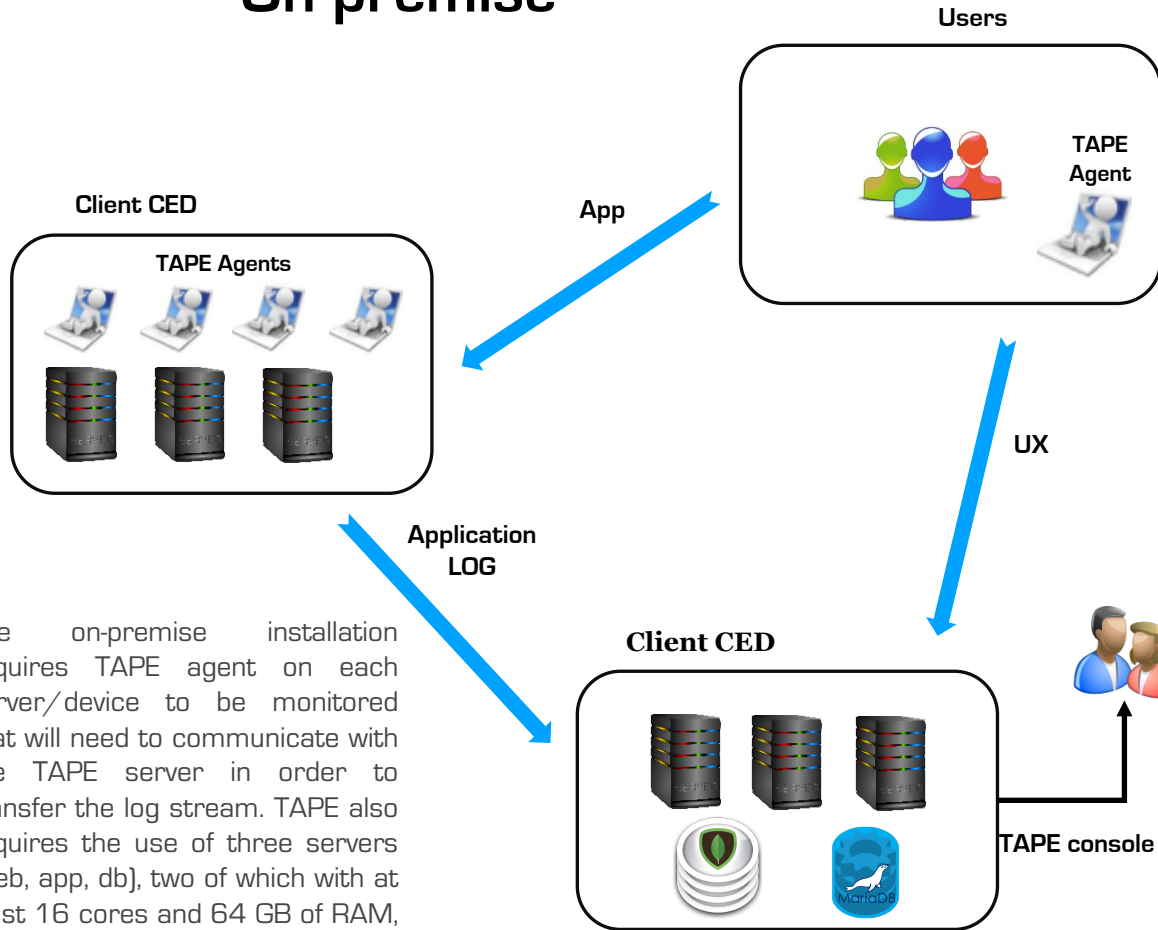
The application monitoring of a hardware and software infrastructure requires precise and calibrated tools, based on what we are looking for. TAPE responds to this need by allowing the analysis of the Application Logs of most common software through proprietary agents or SNMP protocol.

With minimal customization, we can create business flows that allow to exactly monitor the beginning and the end of a transaction. In more general environments, TAPE monitors all the main functions such as CPU, memory, I/O and network, finding the right correlations to avoid false positives reporting. Precisely for these reasons, TAPE is provided with a system called **IA**alarm that is able to understand if we are facing a real problem or a temporary fluctuation. The **IA**alarm algorithm is fed through the acquisition of daily routines that allow it to understand the normal functioning of the monitored system.



Hardware Architecture

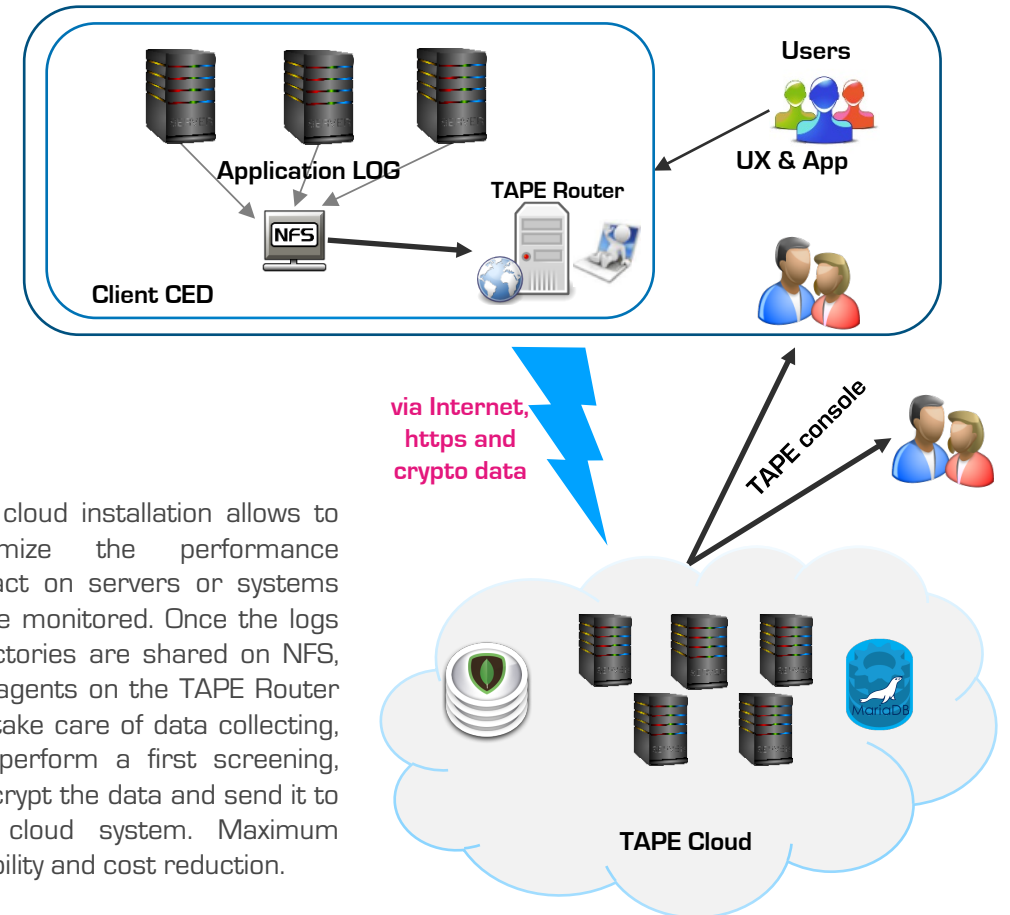
On premise



The on-premise installation requires TAPE agent on each server/device to be monitored that will need to communicate with the TAPE server in order to transfer the log stream. TAPE also requires the use of three servers (web, app, db), two of which with at least 16 cores and 64 GB of RAM, based on the number of servers or systems to be monitored.

Cloud

Available on June 2018



The cloud installation allows to minimize the performance impact on servers or systems to be monitored. Once the logs directories are shared on NFS, the agents on the TAPE Router will take care of data collecting, will perform a first screening, will crypt the data and send it to the cloud system. Maximum flexibility and cost reduction.



Software Architecture

The diagram on the side shows all the components and application modules used for the acquisition, processing, presentation and maintenance of the TAPE system.

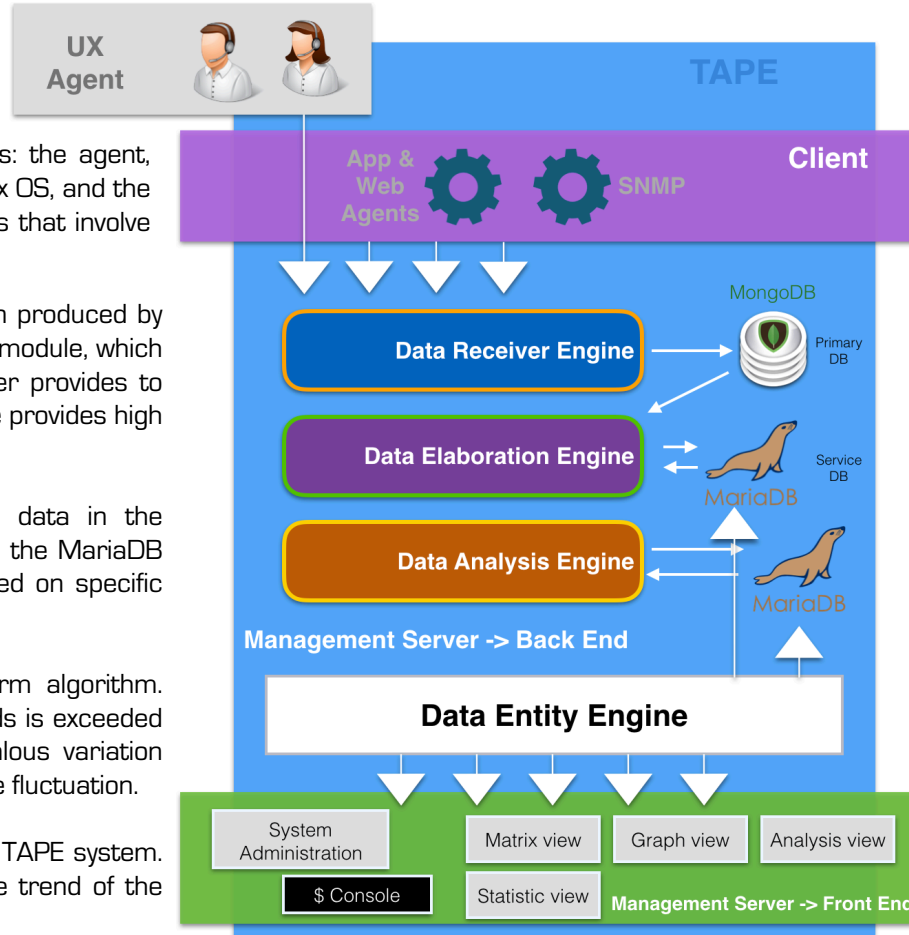
In the Client section there are two types of system power supplies: the agent, which can be used on servers with Windows, Oracle Solaris and Linux OS, and the SNMP module, used to receive information on the status of systems that involve this protocol.

The Data Receiver Engine is responsible for receiving all information produced by the Client section: in particular, it integrates, if necessary, the SNMP module, which for convenience has been moved in the Client section. The Receiver provides to save the information in the noSQL MongoDB database. This database provides high performance during loading.

The Data Elaboration Engine takes care of processing entered data in the mongoDB database. The data will be processed and aggregated on the MariaDB relational database. The elaborations and aggregations will be based on specific algorithms for a proper production of information.

The Data Analysis Engine is the processing section for the **IA** alarm algorithm. Notifications are produced whenever one of the configured thresholds is exceeded and when the **IA** alarm system understand that there is an anomalous variation compared to the regular functioning of the system and not to a simple fluctuation.

The Data Entity Engine deals with "serving" the web interface of the TAPE system. Through the web interface it is possible to check the near-real-time trend of the load situation through ad-hoc graphs and dedicated views.



The basic software used for the creation of the TAPE system is completely free, no additional license to activate is requested.

The Agents modules for the application and web part are developed in **C++** while the agents for the User Experience section are in **Javascript**.

The data reception software, the so-called Receivers, is developed in **Node.js**, as well as the Processing, Analysis and Entity modules, including the **IA** alarm process.

The whole Front-end WEB section is developed in **AngularJS**.

The choice of non-proprietary software was made in order not to have dependent on additional costs and because the quality of the software is now at an Enterprise level.

Agents in C++ are available for the most common operating systems (Solaris, Windows, HP-UX and Linux).

Node.js has been chosen as the basic software for TAPE because it allows a precise and very advanced multi-process and multi-thread management.

The DB section has two types of databases: a noSQL **MongoDB** DB, for the storage of information sent by the agents, and a **MariaDB** relational DB for the treatment of the processed information.

The operating system used for TAPE is **CentOS 7**.



Application Technologies

The architecture to which TAPE project wants to converge provides a level of access and presentation, in which there is a portal to access application services, the website for configurations and analysis and a command line console, to be used by more experienced personnel. Below this level we can find the various application services, which allow monitoring, analysis, processing, aggregation and correlation of data, production of advance reporting to support decision-making processes, and the IAAlarm system.

At the base of the hierarchy are the databases and the archives. Infrastructure communications will be guaranteed by cross-services to the different modules, such as user authentication and access rights management, the operation log and the notification system. On the side, the graphic representation of the TAPE software product.

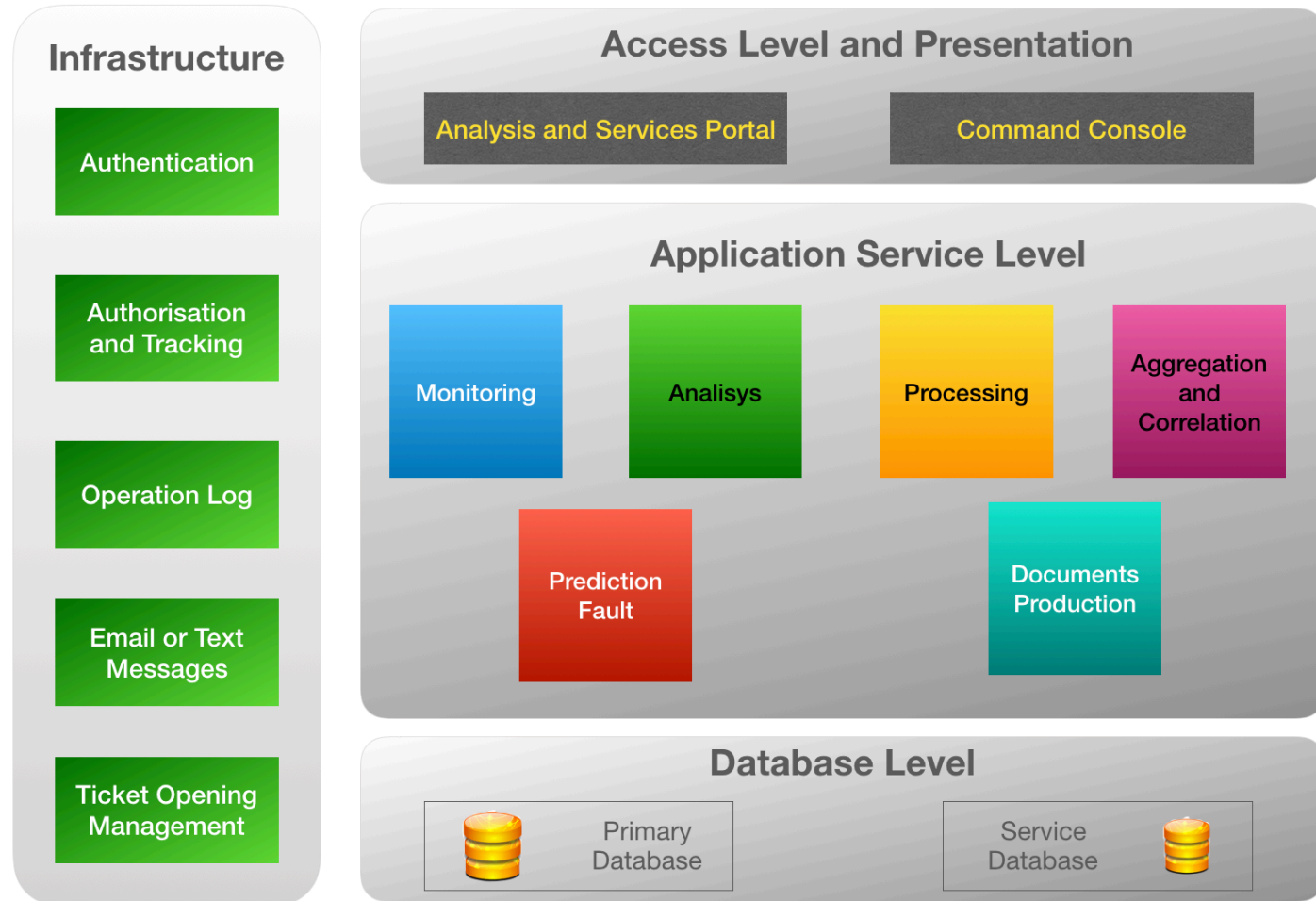
Authentication layer: responsible for the management of authentication and access to individual system components, with the administration of roles and profiles through authentication mechanisms based on standard solutions.

Integration layer: responsible for integration and interoperability with external systems realized through WS-based solutions, application cooperation services, collection of structured XML feeds, management of authentication and profiling data.

Presentation layer: responsible for managing UX, interactions with the user, navigation through the pages and for invoking the business services provided by the application layer. The use of frameworks that implement the MVC pattern, allows the division of responsibilities for the management of interfaces.

Business layer: responsible for the execution of the business logic, deals with the analysis and processing of data, with the correct and efficient use of the DB, with the preparation and formatting of the data towards the presentation layer, with interfacing towards external systems, with the management of logging and queries forwarded to functional modules of the architecture.

Persistence layer: responsible for data persistence, making the application independent of the DBMS.



Dedication to Siebel®

TAPE is a generic end-to-end monitoring system that can be used on different types of Software Platforms; here it has been used with Siebel.

- **Application Performance Monitoring**

TAPE collects information on the Siebel applications and provides the time for each transaction performed by users, with the possibility of creating a Business-Action sequence and analyzing it over time.

- **Business Action Sequence**

It allows the creation of a sequence of activities in order to analyze a set of operations that can be selected with relative times and states.

- **Server Performance Monitoring**

Performance information such as CPU load, memory, disk usage and exchanged bytes are acquired and analyzed.

- **Inbound and Outbound EAI Monitoring**

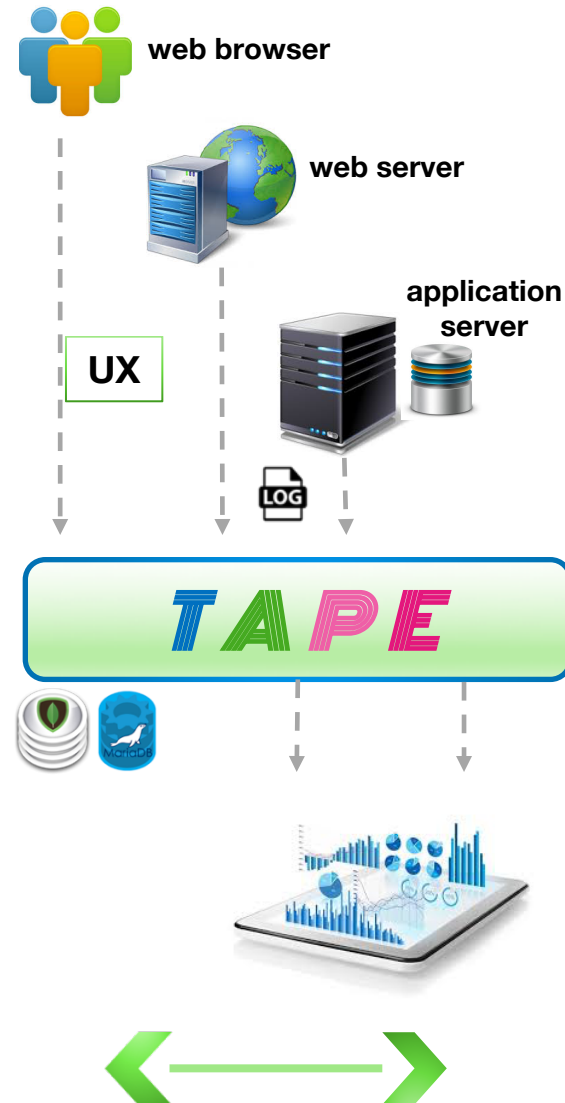
EAI components are also monitored both inbound and outbound, providing a detail on user calls and information.

- **Workflow Monitoring**

The Siebel Workflows are checked and shown in a graph, showing quantity and running times.

- **Analysis of application crashes**

Every single Siebel crash generated (FDR) is extracted and placed in a document, in order to be supplied to the appointed personnel.



- **Analysis of application queries**

Queries above the second are monitored and reported in the user interface, then further analyzed.

- **User Experience flow analysis with correlation of UX-Web-App-Db information**

In TAPE Transactions section it is possible to check user's page browsing and the operations he performed during the activity.

In order to perform analysis on Siebel it is necessary to have some log events set to debug. For this reason, the agents are provided with a system that allows them, if activated, to compress the logs and eliminate them, if needed. This procedure is also valid for web logs.

The information is treated in such a way that it does not violate any form of privacy as the data, during the transfer, is encrypted and once processed is removed, leaving only the aggregated data and any notifications.

In my work, Siebel has always had its charm but sometimes the difficulty lies in understanding what it wants to tell you. Understanding it, with TAPE, has become much easier.
Milvio Mazza
Siebel Architect

Ticket Management Integration

Version 3 of TAPE integrates ticket management through the use of APIs made available by BMC, ServiceDeskPlus, Freshworks and Mantis developers. When a notification based on intervention policy appears, a ticket is created directly on the management system. Only events with the "error" type will be reported if exceeding the threshold or if reported by the **IA** alarm algorithm.



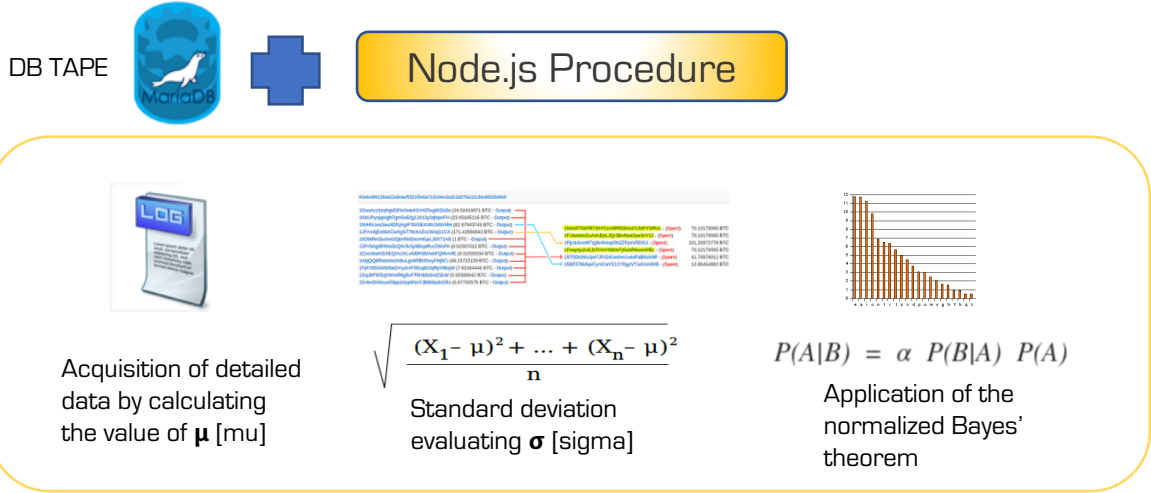
Data: 27/12/2017 | Nome Server: dc4nsblcore01 | Id Server: 11

ID	ID Dati	Tipo	Descrizione	Valore di Soglia	Valore Effettivo	% CPU Picco	Data Acquisizione	Data Elaborazione	Tipo Evento
1019	806905	SWSE	LoginTime - UId: 40894474 - User: OPCC02010 - Status: Successful	60	176,000 (secondi)	0	2017-12-27 20:42:15	2017-12-28 14:06:43	error
546	5	EAI	EAI Inbound - TaskId: 12582943	20	23,950 (secondi)	0	2017-12-27 20:37:46	2017-12-27 07:00:29	warning



IAlarm

Prediction Fault - Macro Detail



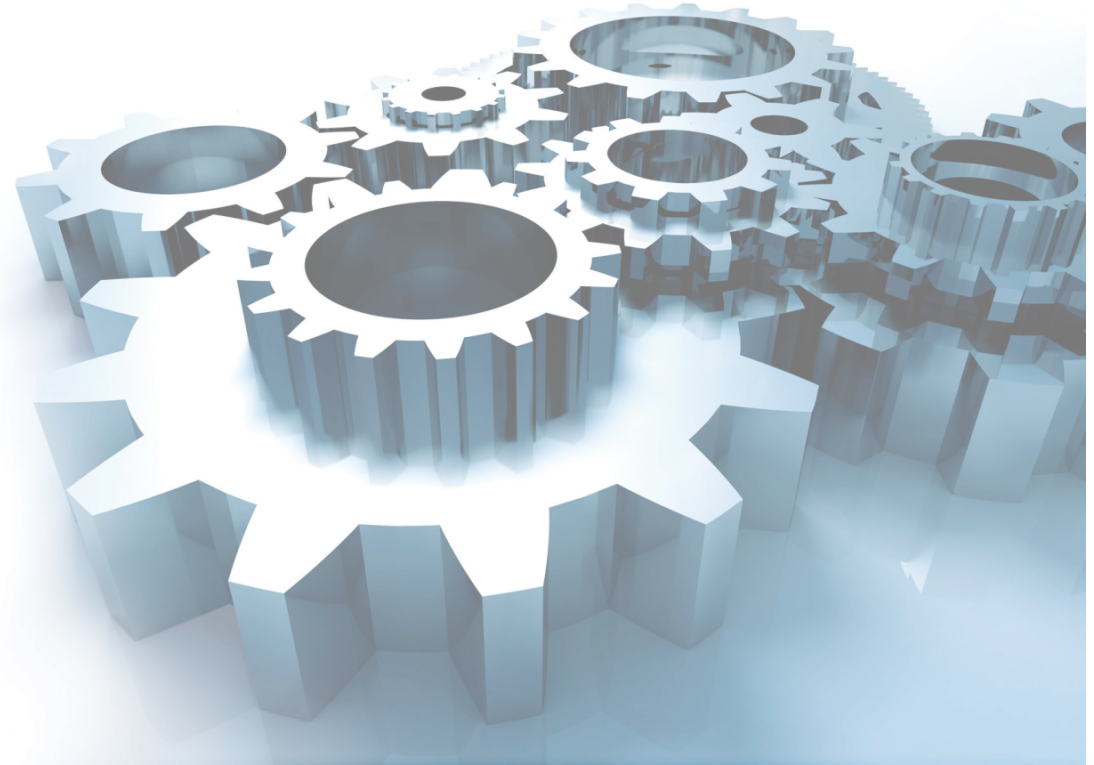
The expected result of the IAlarm procedure is a series of values that will be compared with values of a normal daily activity. The system examines (through night-time processing) the days chosen by a TAPE Administrator user. The minimum number of days is set at 20, in order to have an adequate amount of data for processing procedures. When a runtime event is correlated with the calculated values, a warning e-mail reporting that the event may occur in short term with a 15-min lower bound is generated.



Features

The main features of the TAPE system can be summarized in the following points:

- Server Performance monitoring (Application and Web)
- Application Performance monitoring (per single application)
- Application crash monitoring
- Siebel Server status monitoring
- Siebel component monitoring: Status and Tasks
- Inbound EAI monitoring
- Log analysis
- Analysis of transactions and in particular: Login, Query, EAI Perf, Execute Process and Show View
- Configurable Business Action Sequence analysis
- User Experience analysis
- Workflow performance analysis and verification
- Organization of users by type with the possibility of geolocation
- Reporting of url called by the system
- User-definable Monitoring Timing
- Configuration and monitoring of application Workflows
- Automated data rejuvenation system





Beyond the future!



T A P E | the best way

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