Root Cause Analysis – Overview
SAP Solution Manager 7.1

Q2 / 2011
Technical Operations in SAP Solution Manager 7.1
Part of Application Lifecycle Management

Upgrade Management
- Integration of Upgrade Dependency Analyzer
- Enhanced Custom Code Lifecycle Management

Solution Documentation
- Enhanced Solution Documentation Assistant
- Reverse Business Process Documentation and IBIS Content integration
- Upload interface to build an initial Business Blueprint structure

Maintenance Management
- Enhanced Maintenance Optimizer
- System Recommendations

Business Process Operations
- Enhanced BPO Dashboards with Alert Inbox
- Cross Database Comparison
- Job Control and Schedule Management

Solution Implementation
- Enhanced Business Blueprint
- Implementing Business Functions
- Integration with the service messages

Template Management
- Comparison & Adjustment for Template
- Roll-in changes from projects

Technical Operations
- New Infrastructure for Technical Monitoring and Alerting
- Technical Administration
- Technical Analytics
- Enhanced Root Cause Analysis
- Data Volume Management
- Configuration Validation

Application Incident Management
- IT Service Management Processes
- Highly configurable web-client user interface
- Additional Service document functions

Change Control Management
- Enhanced Quality Gate Management for various activities
- Enhanced process flexibility for Change Request Management
- Improved mechanism for the change and transport backend
- Configuration Validation and Change Analysis
The process behind technical operations…

Monitor

Proactive real-time monitoring

Notify

Reactive handling of critical events

Analyze

Lower mean time to problem resolution

Optimize

Optimize excellence of technical operations

Report

Prove value to business

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The capabilities of technical operations

- **Technical Monitoring & Alerting**: One infrastructure for all monitoring and alerting covering SAP & non-SAP

- **Root Cause Analysis**: Analyze issues in heterogeneous landscapes with one look-and-feel

- **Technical Administration**: Optimize operation of your IT and application landscape

- **Technical Analytics**: From technical reporting to management reporting, out-of-the-box and extendable

- **Configuration Validation**: Ensure that your landscape is configured compliant to your policy and references

- **Data Volume Management**: Manage data growth and archiving procedures in your landscape
Overview of End-to-End Root Cause Analysis

What’s new in RCA in Solution Manager 7.1
Root Cause Analysis
Which applications are provided…

End-To-End Workload Analysis
- General performance overview for heterogeneous landscape
- Review most important KPI’s cross all technologies and drill down to product specific workload KPI’s

End-To-End Change Analysis
- Statistical change data cross all technologies based on daily configuration snapshots
- Compare configurations between systems and drill down to change reporting for a detailed change history

End-To-End Exception Analysis
- Statistical exception data cross all technologies for exception trend analysis or review exception after changes
- Jump to component specific exception analysis (ST22, NWA,…)

End-To-End Trace Analysis
- Single user request tracing in a complex system landscapes
- Identify the problem causing component (performance and functional) and jump-in to detailed component specific trace analysis (SQL, ABAP, J2EE trace,…)

System, Host & Database Analysis
- Central, safe and remote access to file system, OS and DB
- Links to read-only monitoring and administration tools like Wily Introscope for performance analysis and monitoring
A typical scenario for Root Cause Analysis

An Employee Self-Service (ESS) user experiences a performance problem in the browser and creates a support message in the customers service desk system. The support employee uses the E2E Workload Analysis to check the server side performance, but no bottleneck can be identified on the server side. So a E2E Trace analysis is use to record the activity of the single end user. The time is spent on the client side. So BMC Appsight can be used to identify the root cause of the bad client performance, which is in this case caused by bad javascript coding.
End-to-End Change Analysis
Architecture Overview

SAP Solution Manager
Business Warehouse

Extractor Framework
( EFKW )
Hourly

Configuration and Change Database
( CCDB )

Change Analysis ➔ Statistical Overview of Changes

Managed Systems

Non-ABAP based installations

Diagnostics Agents

ABAP based installations

Extractor Framework
Daily

Solution Tool Plugins (ST-A/PI)

Change History

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End-to-End Exception Analysis
Architecture Overview

Exception Analysis ➔ Statistical overview of Exceptions

List of detailed exceptions

Jump-In to component specific analysis transaction

SAP Solution Manager Business Warehouse

Managed Systems

Non-ABAP based installations

Diagnostics Agents

Extractor Framework
Hourly

ABAP based installations

Solution Tool Plugins (ST-A/PI)
End-to-End Workload Analysis
Architecture Overview

SAP Solution Manager
Business Warehouse

Extractor Framework (EFWK)
Hourly

Introscope Enterprise Manager

Managed Systems

Non-ABAP based installations (Java / J2EE / .Net / C/C++)

- Diagnostics Agents
- Introscope ByteCode Agent

ABAP based installations

- Diagnostics Agents
- Solution Tool Plugins (ST-A/PI)

End-to-End Workload Analysis

Cross-Component Workload Analysis

Component-Specific Workload Analysis
End-to-End Trace Analysis
Architecture overview

Record end user activities

Collect trace data in Solution Manager

Analyze in detail and find root-cause

Understand request flow
**Introscope** is a performance management solution that enables you to monitor complex applications in production environments 24x7.

http://www.wilytech.com (part of CA)

- Real time (15 s) monitoring using
  - Dashboards
  - Investigator

- Dynamic transaction tracing

- Dynamic byte code instrumentation for
  - J2EE
  - .Net

- Static instrumentation for C/C++ based products available

- Delivered with standard instrumentation and standard dashboards for SAP & Partner products, eg:
  - SAP NetWeaver XI
  - SAP NetWeaver Portal
  - SAP NetWeaver MDM
  - Seeburger XI Adapters
  - CPS for SAP by Redwood
  - ...
Over 200 predefined dashboards (and counting)
SAP Extended Diagnostics by CA Wily

**CA Wily Introscope right to view license**
- ...included in SAP Solution Manager license
- ....includes license of Wily Introscope for SAP delivered instrumentation and dashboards (read-only)
- ...valid for components delivered by SAP

**Extended Diagnostics by CA Wily license**
- ...needs to be purchased separately
- ...extends license for creating instrumentation or dashboards for custom code
- ...extends to third-party application platforms

**SAP Extended Diagnostics by CA Wily includes the following**
- Introscope – Base Components (Enterprise Manager, Agent, Workstation)
  - Main documentation
  - Agent files
  - EPAgent
  - DotNetAgent incl. Leakhunter
- Introscope – Application Server Components
  - Power Packs and Portal Manager packages for WebSphere, WebLogic
- Introscope – Integrations (CA Unicenter, Integration SDK)
- Add-ons and Platform Support for Introscope and CEM (Change Detector, Oracle DB, Webservers, Service Quality Manager, Siteminder,...)
BMC Appsight is a system built on a unique problem resolution architecture that was designed from the ground up with patented Black Box technology to optimize the problem resolution process.

http://www.identify.com (part of BMC)

- Appsight enables the analysis of
  - Client Performance
  - in combination with User Interaction
  - on a code level

- Available recording profiles for all SAP Client applications
  - Internet Explorer
  - SAPGui
  - NetWeaver Business Client
  - ...

- SAP Solution Manager includes the license for...
  - … the recording agent of Appsight ( „Black Box“)
  - … the console of Appsight
Overview of End-to-End Root Cause Analysis

What’s new in RCA in Solution Manager 7.1
Overview of New Features in Root Cause Analysis

New Integration in SolMan Administration WorkCenter
New Applications for Host & Database Analysis
Links to Documentation in Wiki & Homepage
Integration of Self Check & Self Diagnosis
Direct access to SolMan_Setup for configuration of managed systems

Flexible query based approach for selection of system based on user preferences

Start Applications in new window or embedded in work center window

Faster navigation by disabling direct start of heavy overview templates

Support for new system types and products, e.g.:
- SAP Business Objects Enterprise XI
- SAP Business Objects BPC
- SAP Business Objects BFC
- IBM WebSphere
- And more…. 
Generic Changes in RCA Navigation

Fast, easy and personalizable navigation features in the Root Cause Analysis Work Center in SAP Solution Manager 7.1

- "Heavy" templates are not loaded by default:
  - **Fast navigation** to further screens without wait time

- **Personalization** of individual work center views and behaviour (see next slide)

- After changing the **timeframe selection** the changes need to be applied to get active
Personalization Options in Work Center

**Global Preferences** (valid for the complete workcenter)

- Choose the „Start Mode“ of applications (embedded in work center window, or in new window)
- Choose the default view (E2E, System, Host, or DB Analysis)
- Choose the LMDB namespace

Define **per work center view**

- The „Start Mode“ in this view
- If one application should be started by default
- How many systems can be selected for one application at maximum
- If a view has subviews, which one should be the default
Changes to E2E Workload and Exception Analysis
Changes to E2E Change Analysis (1/2)

- Identify how many changes have been done to different types of RFC destinations.
- RFC’s has been created / changed / deleted.
- What has been changed?

Detailed information in Change Reporting, which RFC’s have been changed.
Changes to E2E Change Analysis (2/2)

- Assignment to selected authorization objects
- Changes to SICF Service
- Assignment of users to selected transactions

User has been authorized to transaction SM59

SICF Service has been activated

Authorization S_DEVELOP has been assigned to user
Changes to E2E Trace Analysis (1/3)

Compare the overall times in an overview

Detailed Analysis on step level and comparison of trace results
Changes to E2E Trace Analysis (2/3)

Current trace settings

"Which traces are enabled with which level"

"What is the impact on the managed system"
Changes to E2E Trace Analysis (3/3)

Detail level in Message Graphics includes now important events in the http communication and adds an overview of the message flow, summarizing the parallel communication flow.
New Application for Host Analysis

A completely new application on host analysis provides access to the most important metrics on a host level, independent from the operating system, like CPU, Paging, Swap, Disk, File Systems and Network.
Data is available in graphical and tabular form. By drilling down it is possible to not only show very aggregated data like average CPU usage by day, but also get a table view of the hourly averages for a complete week.
End-to-End Host Analysis
Disk & Filesystem

Data for disk utilization is by default filtered on Top 5 disks by utilization, condition can be removed to get full list. Data for file systems is by default filtered by Top 10, including metrics on used space, free space. Full information available by disk or file system.

Disk Utilization in %
Available Metrics: Response Time, Service Time, Wait Time, Queue Length, KB / s, Operations / s

File System Utilization in %
Available Metrics: Used Space, Free Space
End-to-End Host Analysis
Network

Even basic network metrics are included which allow a first analysis in case of network problems.
New Application for Database Analysis

A completely new application on databases analysis provides access to the most important metrics from the Database Performance Warehouse, the available metrics are depending on the database manufacturer.

Supported DB systems:
- MaxDB
- IBM DB2 / DB6
- MS SQLServer
- Oracle

Only excerpt shown here…
End-to-End Root Cause Analysis

Summary

End User Root Cause Analysis

- **Centralized root cause analysis** to identify in complex system landscapes the component actually causing the problem

- **Unified and standardized problem resolution process** with identical look-and-feel covering SAP based and non-SAP technologies and products

- Balanced approach between analysis activities to be conducted at managing system (**cross-component analysis activities**) and analysis activities to be conducted at managed system (**single component analysis activities**)  

- Problem resolution based on **permanently collected aggregated data** for exceptions, changes and workload as well as **unaggregated data** for software and parameter changes

- Interactive root cause analysis for performance and functional problems powered by **End-to-End Trace Analysis**
More Information

Root Cause Analysis Home in SDN:
http://wiki.sdn.sap.com/wiki/display/TechOps/RCA_Home

Technical Operations in SDN
http://wiki.sdn.sap.com/wiki/display/TechOps

Application Lifecycle Management in general
http://service.sap.com/alm

Relevant SAP Notes:
1010428 – Supported Products with SAP Solution Manager 7.0 (and EhP1)
1293438 – Supported Partner Products
1478974 – Supported Products with SAP Solution Manager 7.1
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