Empowered by Innovation NEC

System Performance Analysis Software

MasterScope Invariant Analyzer

December 2009, NEC Corporation

Agenda

1. Current Situations and Problems of Large-scale IT Systems

2. Introduction to MasterScope Invariant Analyzer

3. Functions

4. Product Information

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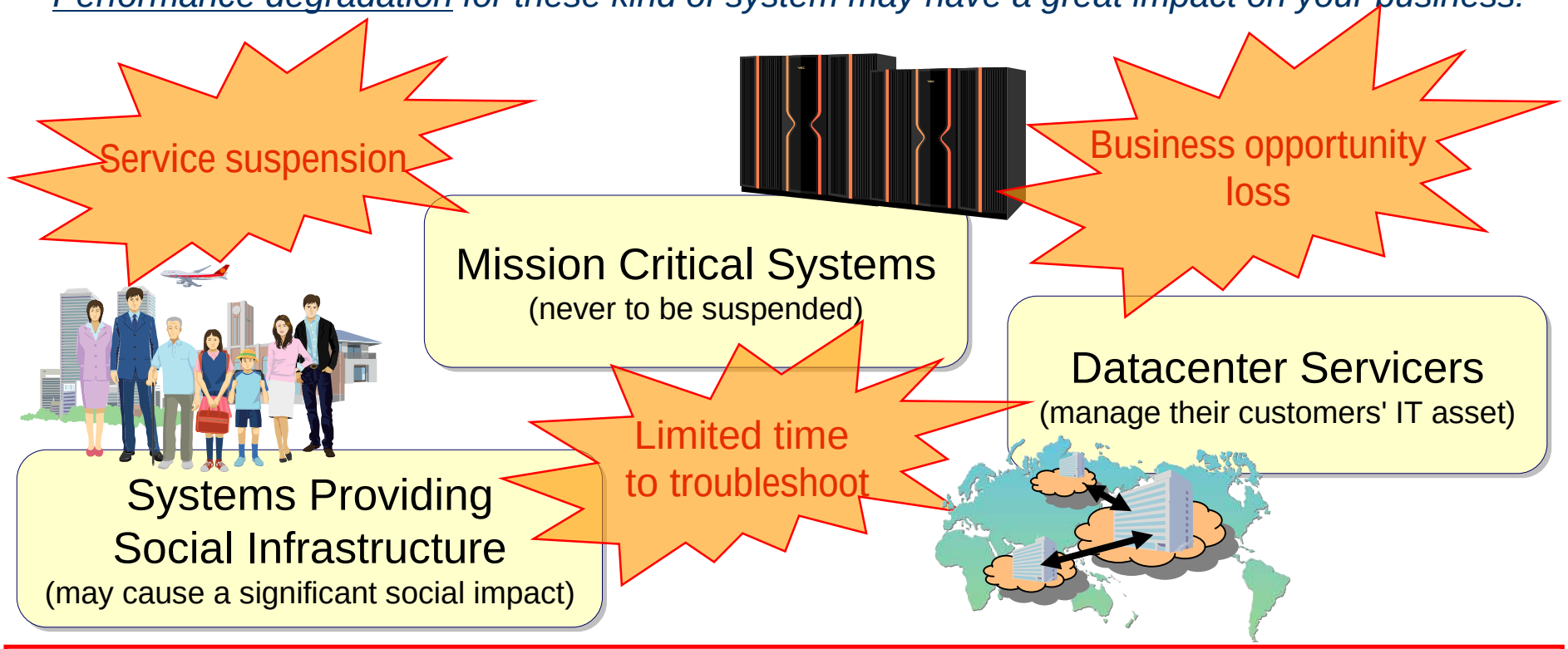
1

Current Situations and Problems of Large-scale IT Systems

1-1. The Importance of Service Level Management

As the IT systems grows in both scale and complexity,
it is getting more and more difficult to maintain high service levels.

Performance degradation for these kind of system may have a great impact on your business!



Performance Management is the key for the efficient Service Level Management.

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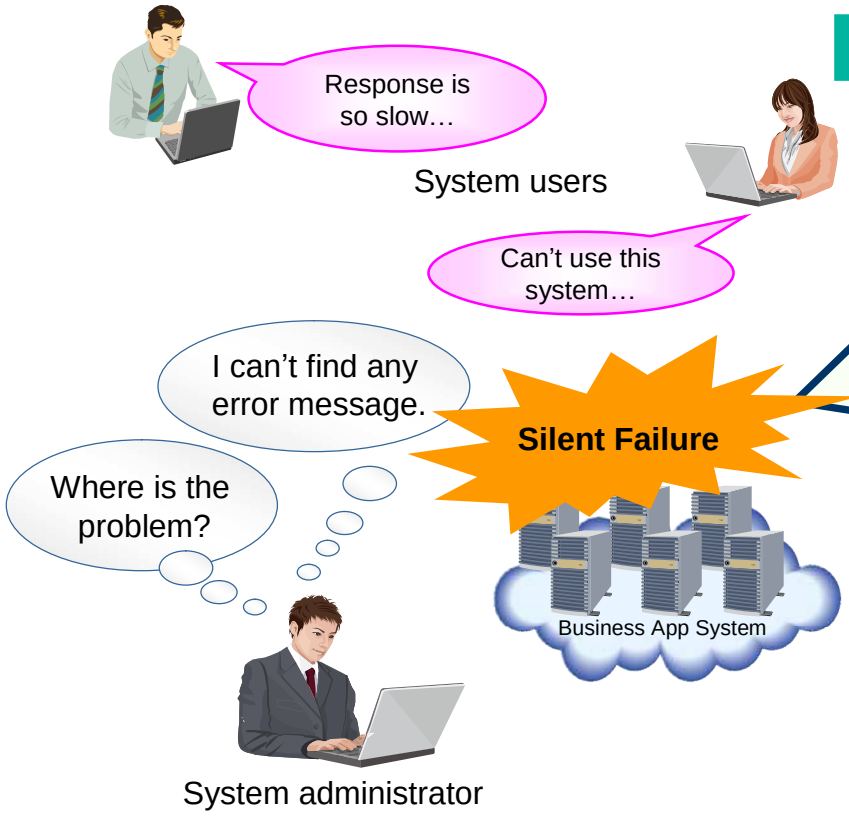
1-2. Performance Issues in Daily IT System Operation

Have you ever found yourself in a situation in which…
Complaints are coming in from users but there are no error messages?



In fact,
a "**Silent Failure**" is occurring!

"**Silent Failure**":
performance degradation caused by **undetectable** bottlenecks, which may lead to actual serious problems.

For example…

By threshold monitoring approach,
it is usually unable to detect silent failures since conventional tools only focus on threshold levels.

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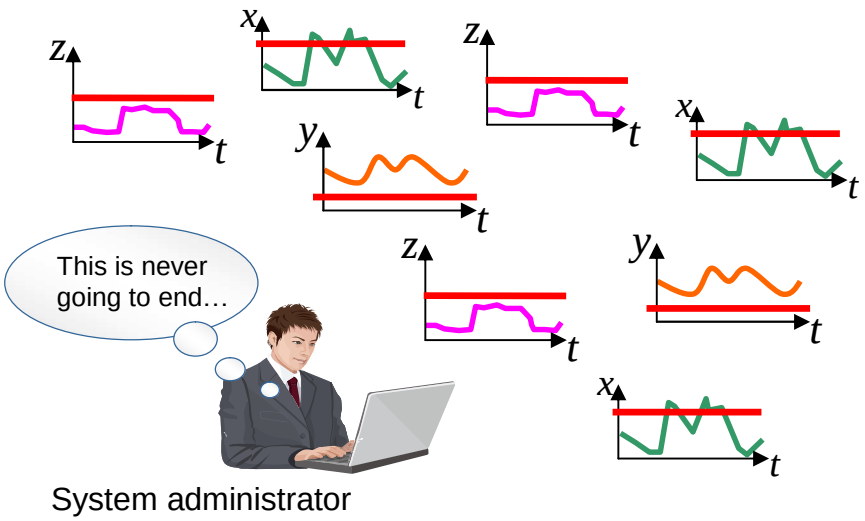
1-3. Challenges

If you operate systems never to be suspended, you cannot stay at ease because Silent Failures can always occur.

Challenge #1

Grasping the whole system's status requires to check numerous data, which takes time and labor.



This difficulty of management itself may cause Silent Failures.

Challenge #2

Various system components need to be checked by each specialist. It requires higher skills and experiences to monitor over cross domain.

Even if Silent Failure is detected…
Solving the failure requires high skill.

Invariant Analyzer addresses all these challenges!!!

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Introduction to MasterScope Invariant Analyzer

2-1. What is Invariant Analyzer?

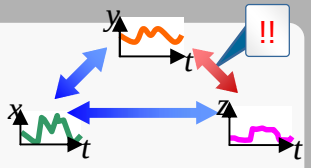
Invariant Analyzer is a system performance analysis software which can…

- ✓ Detect and diagnose Silent Failures.
- ✓ Help you predict and avoid future failures.

Key Features

Feature 1 Automatic Detection

Detects system performance issues (Silent Failures) before they become critical problems.

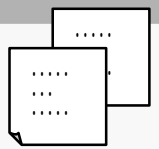


Feature 2 Visualization

With graphs and map views, it visualizes “abnormal behaviors” for quick and intuitive understanding.

Feature 3 Knowledge Base

You can record actions you took for future reference to enable a prompt action to the current failure.



Feature 4 Easy Setting

Performance data obtained from well-known monitoring tools is only required. Additional instrumentation are unnecessary.

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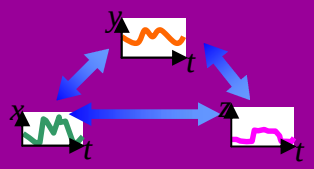
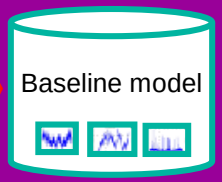
2-2. Easy Steps for Fast Failure Resolution

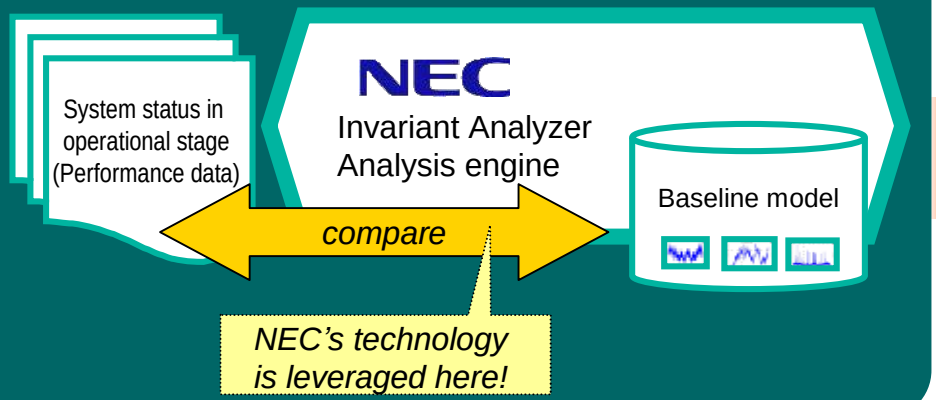
0. *Initial preparation*

- Learn “invariant” relationships existing in performance data when the system is working normally.
- Generate a baseline model from those relationships.



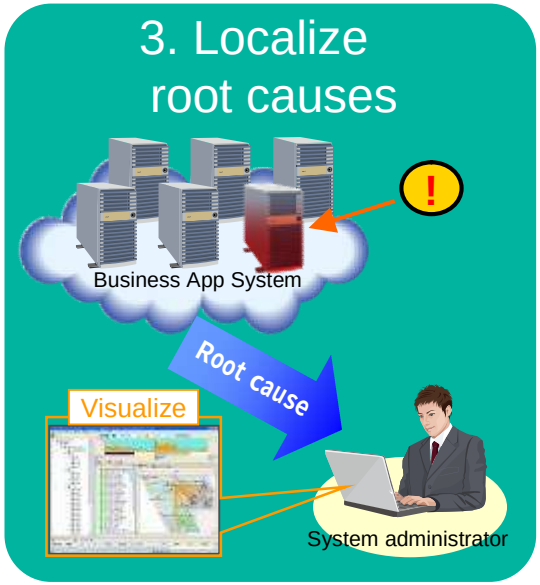


1. Compare system status with the model

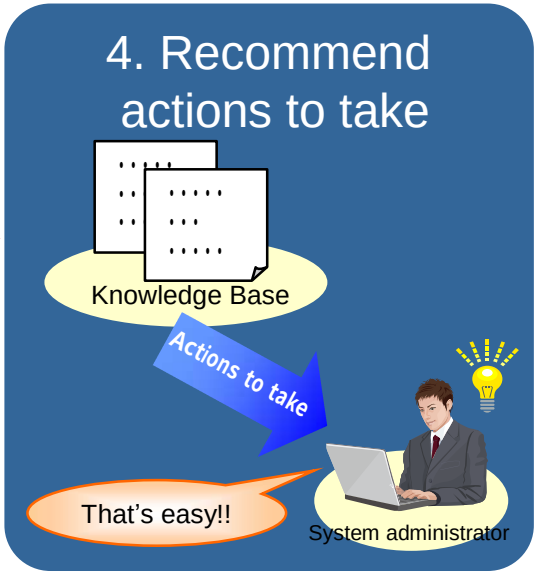


2. Detect failures

3. Localize root causes



4. Recommend actions to take



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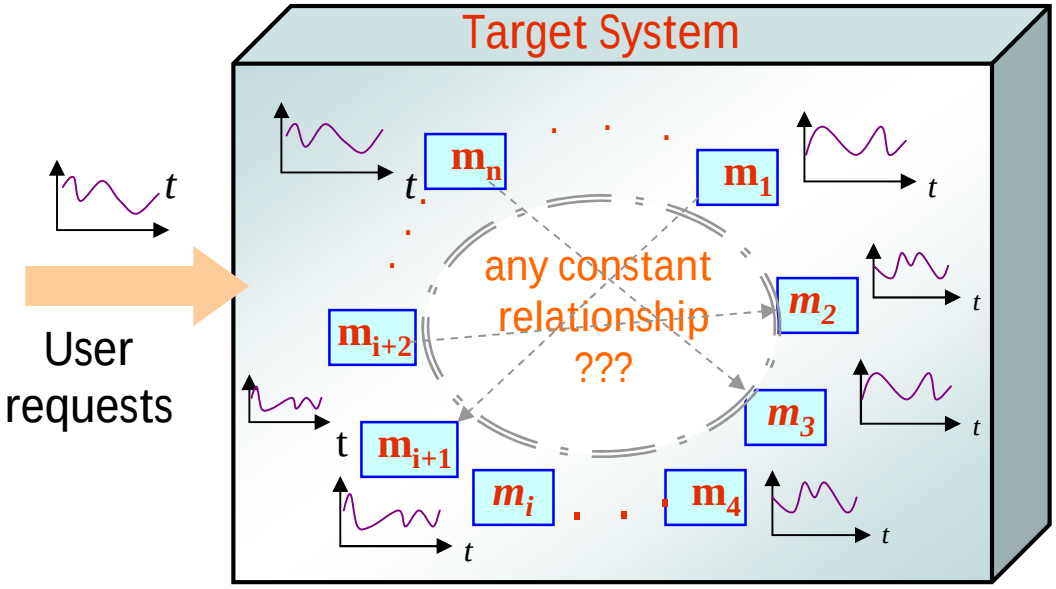
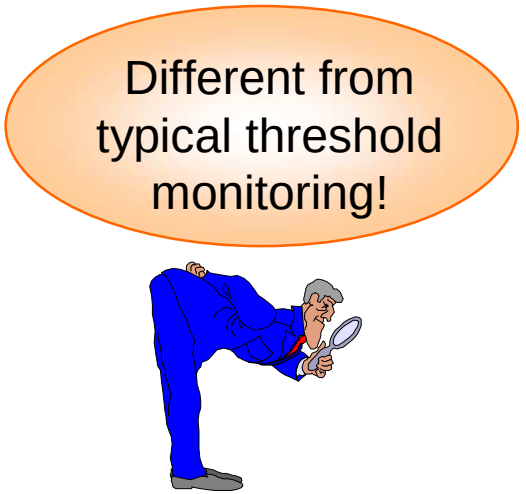
2-3. NEC's Unique Technology

Invariant Analyzer leverages an unique method, that focuses on relationships among performance data (= invariants).

- Search the relationships among performance data collected at various points.
- If modeled relationships continue to hold all the time, they can be regarded as **invariants** of the system.
- By checking if the modeled relationships (= **invariants**) of the input performance data continue to hold or not, you can detect and localize the problem





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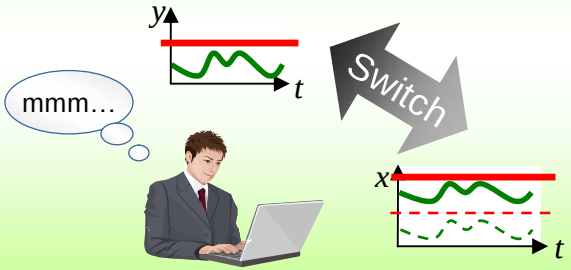
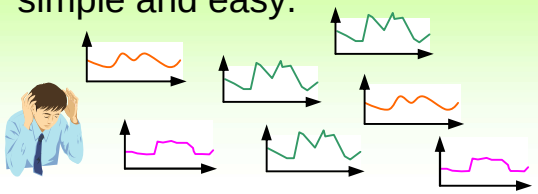
2-4. Key Advantages

Conventional tools

✓ Frequent review of the thresholds required, in accordance with the various business conditions.

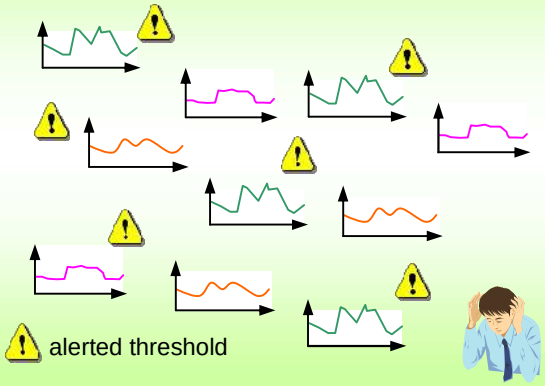


✓ Analyzing numerous data is not simple and easy.



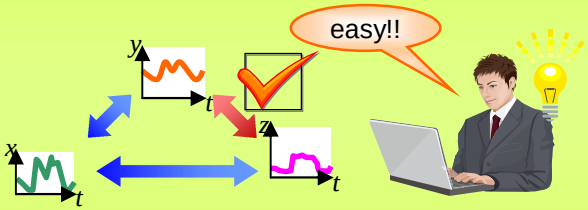
✓ It requires each technical field's expert knowledge.

✓ You have to find out the root cause by yourself.



Invariant Analyzer

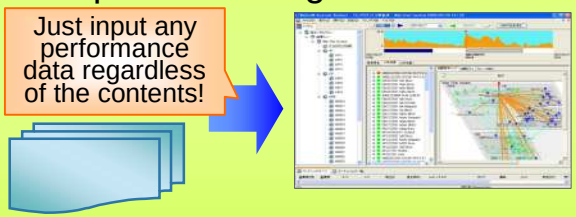
✓ It is unnecessary to set up thresholds since it focuses only on invariant relationships among performance data.



#1. Required implementation effort for management is very light.

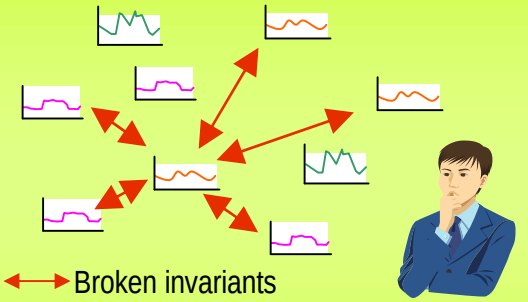
✓ Numerous data can be analyzed simply.

✓ It becomes easy to analyze the entire system status without expert knowledge.



#2. Realize efficient management by simple operation.

✓ Easy to imagine the root cause visually.



#3. Make it easier to localize the associated root cause.

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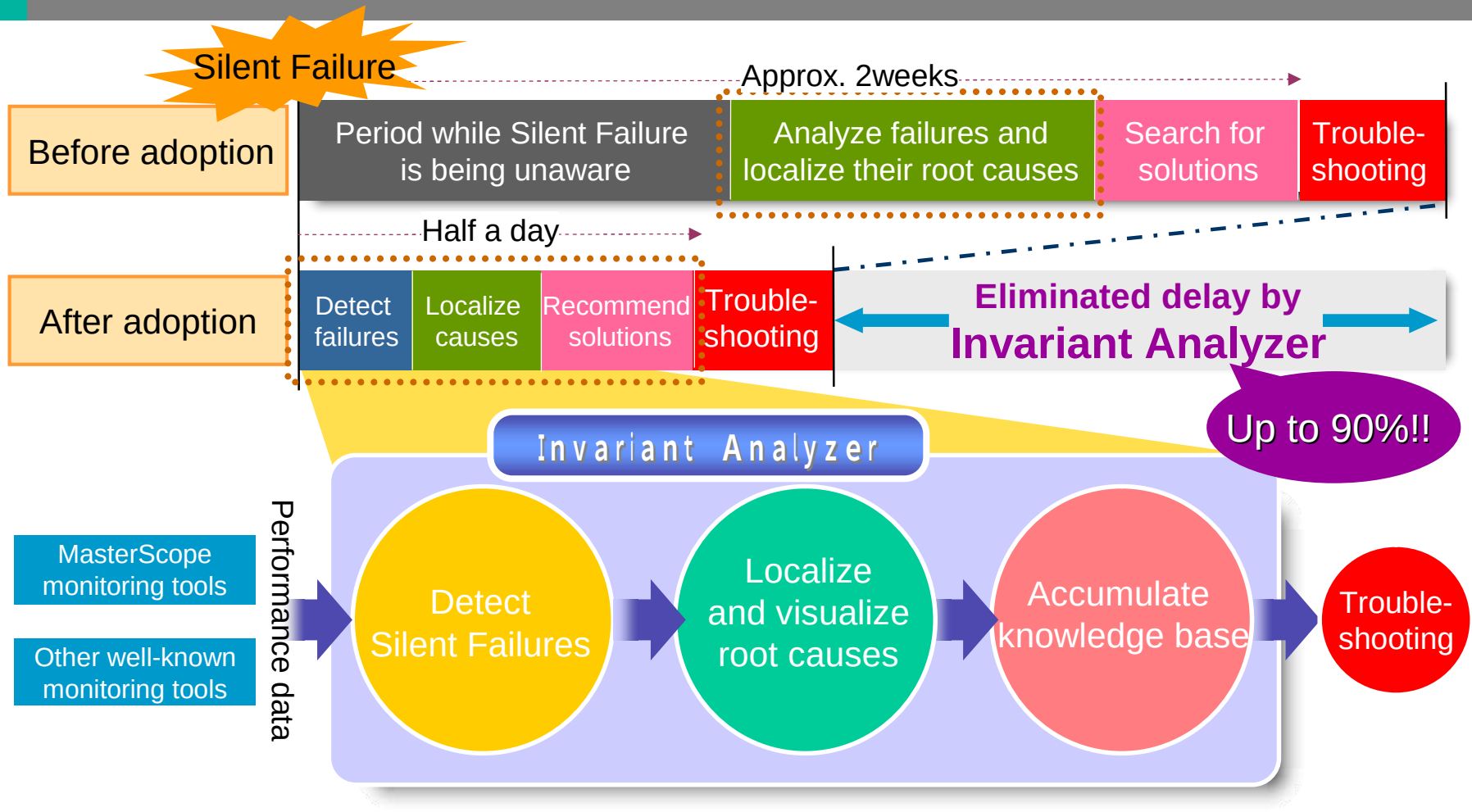
2-5. Benefits

Invariant Analyzer offers the optimized performance management through the fastest failure resolution.



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3

Functions

3. Functions at a Glance

Functions	Overview	Descriptions
1. Basic screen	Basic screen	Simple and easy to understand basic screen displays analysis results on one screen.
2. Root cause visualization	1. Visualize failure occurrence by graphs.	Graphs indicate the time of occurrence and severity of the failures.
	2. Localize failure occurrence by map views.	Map views show specific component primarily causing “abnormal behavior” and their impact.
	3. Visualize failure location by pie charts.	Pie charts can help administrators determine the failure’s root cause from the statistical point of view.
3. Failure resolution	Knowledge base	Actions taken in response to each failure can be recorded in knowledge base for future reference.

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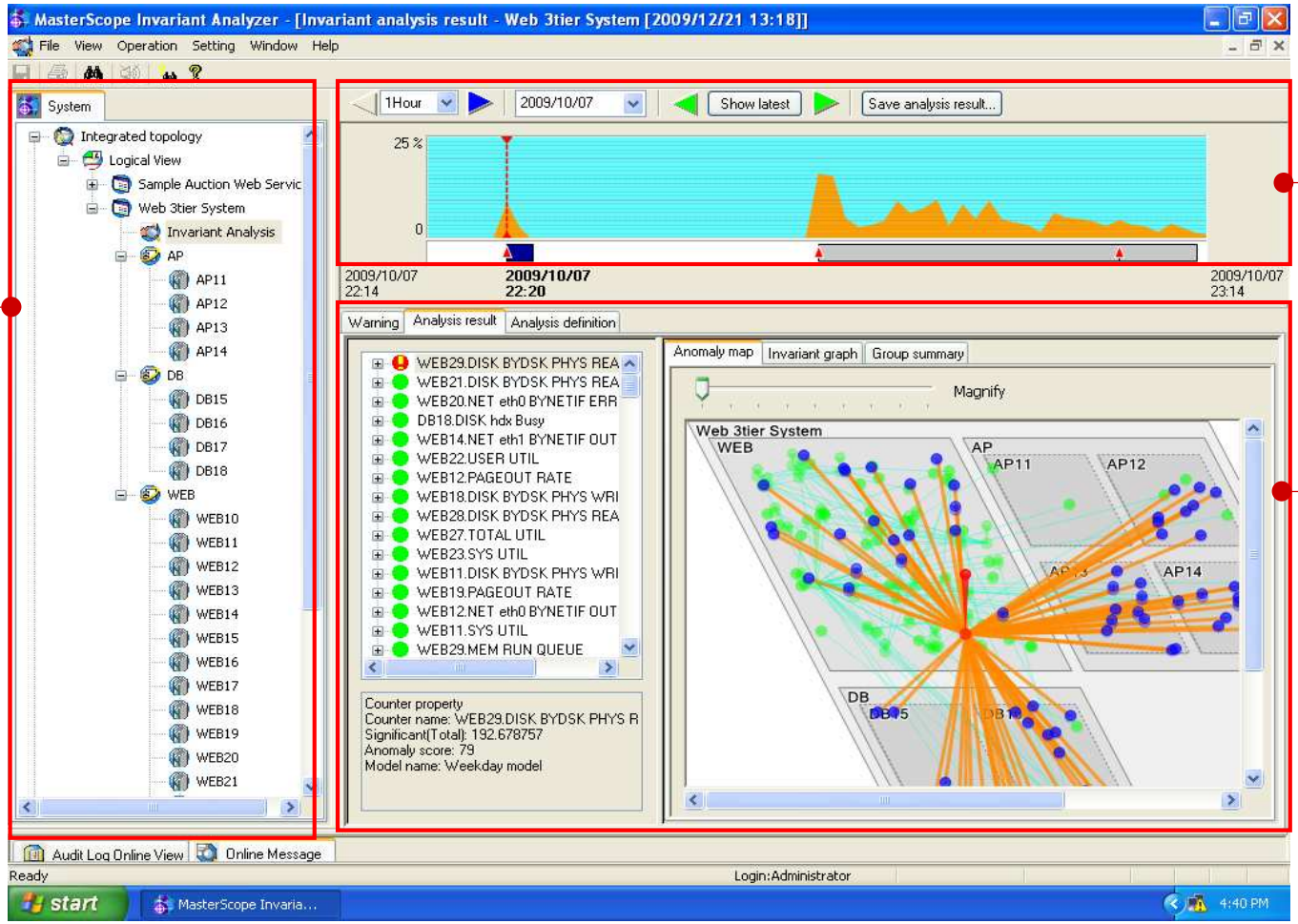
3-1. Basic Screen

Simple and easy to understand basic screen displays analysis results on one screen.



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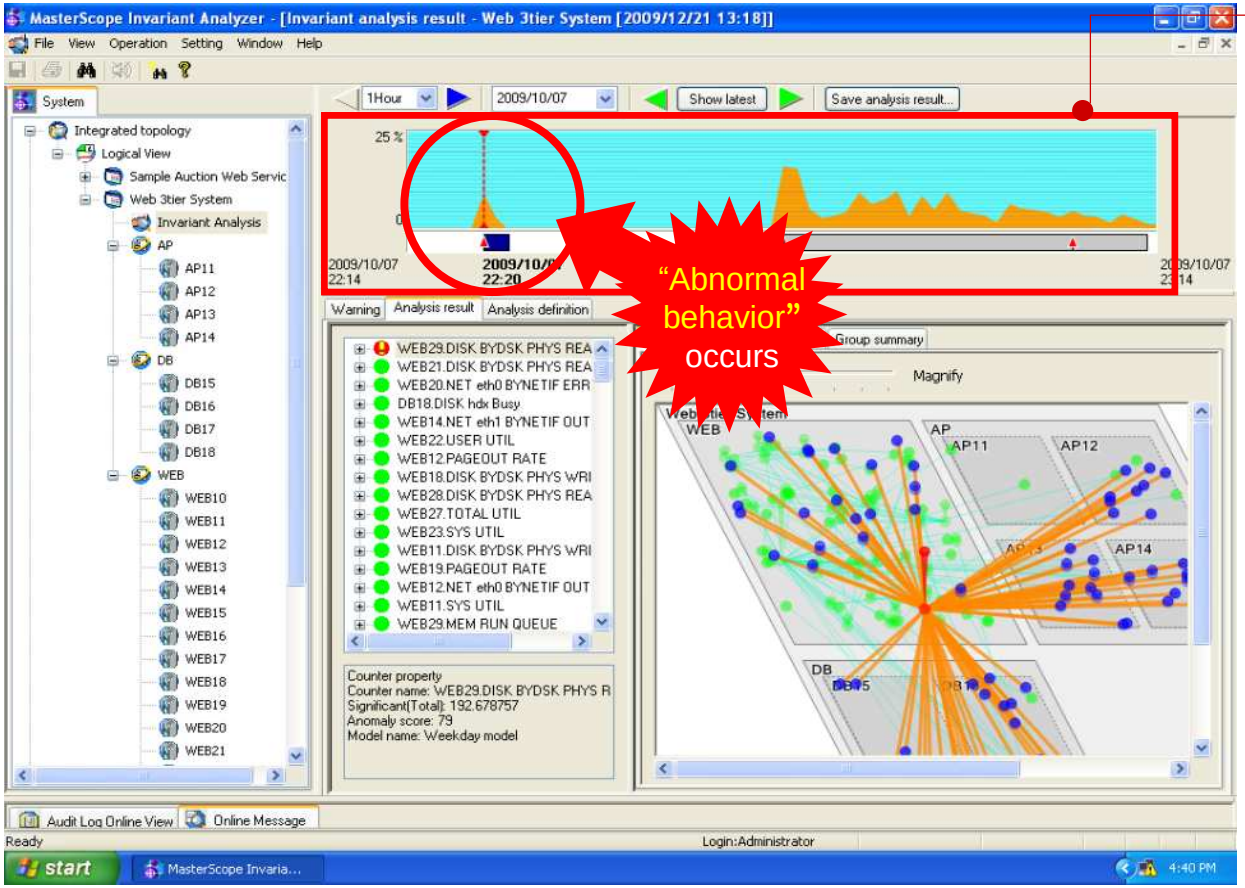
3-2. Visualize Failure Occurrence by Graphs

Root cause visualization(1)

Graphs indicate the time of occurrence and severity of the failures.

You can see when the “abnormal behavior” occurred and how abnormal the behavior is.



Visualize “abnormal behaviors”

Shows the time of occurrence and the severity of the abnormal behavior by an intuitive graph.

Clear graphical presentations prevent oversight of failures.

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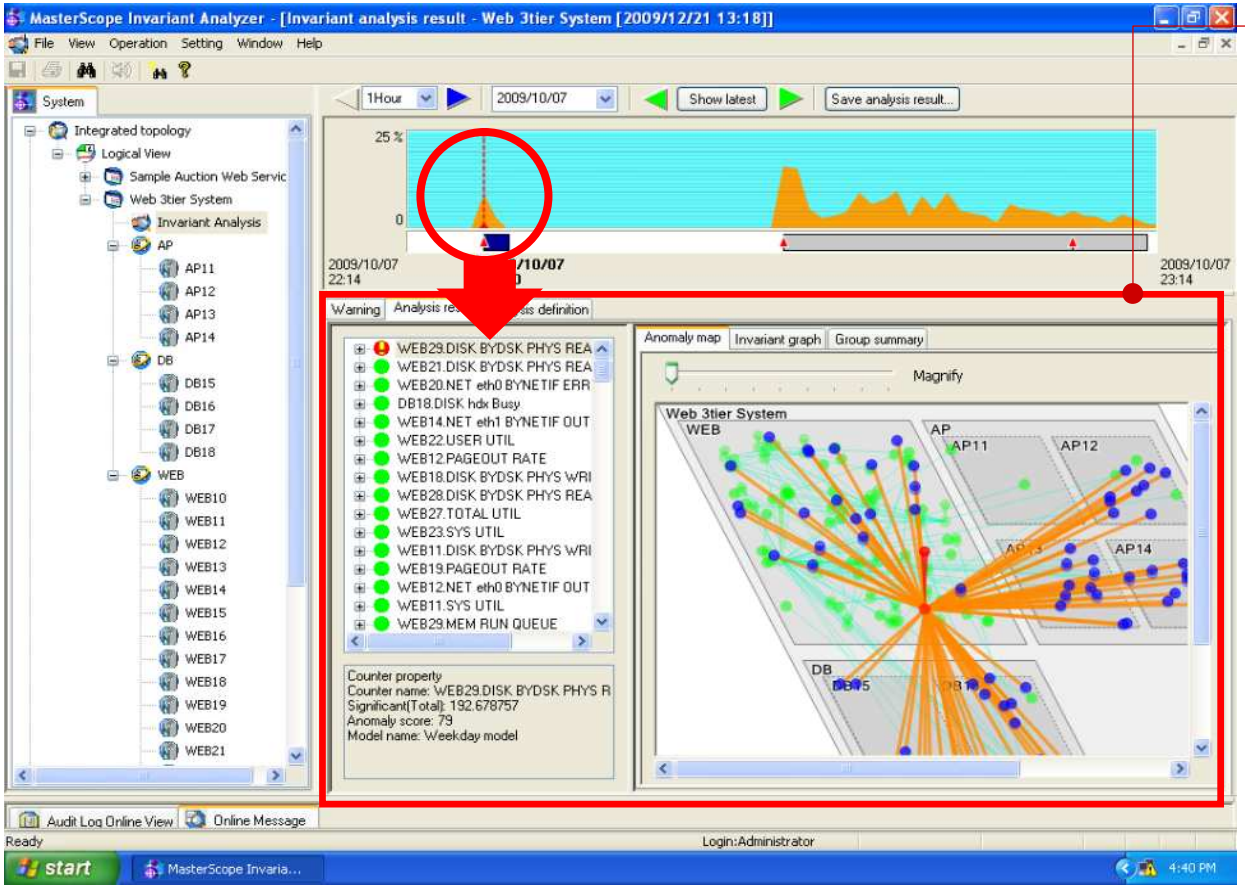
3-2. Localize Failure Occurrence by Map Views

Root cause visualization(2)

Map views show specific component primarily causing “abnormal behavior” and their impact.

- Extract and visualize specific component primarily causing the ”abnormal behavior” by automatic analysis.
- The impact of such behavior also can be discerned at a glance.



Visualize by map views

The red point Indicates the main component causing the ”abnormal behavior” and its severity.
The blue points indicate all the component affected by the root cause.

Easier and quicker investigation will be realized!!

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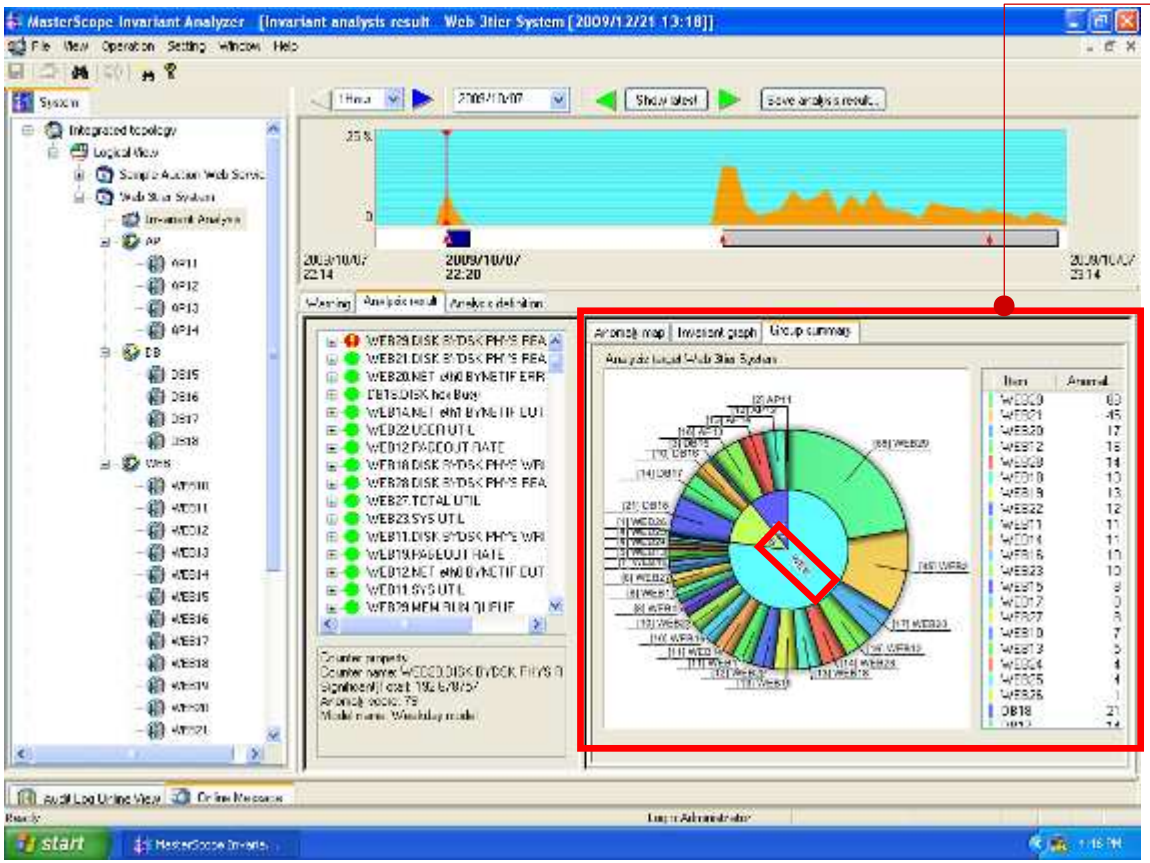
3-2. Visualize Failure Location by Pie Charts

Root cause visualization(3-1)

Pie charts can help administrators determine the failure's root cause from the statistical point of view.

Indicate which server the failure occurred on most likely.



Visualize by pie charts

The pie chart is separated into two parts. The outer part shows on which part of the system (e.g. web servers) the failure is occurring most likely.

The inner part shows on which specific server the "abnormal behaviors" are occurring a lot and its detailed score.

Required efforts to localize the root cause will be greatly reduced.

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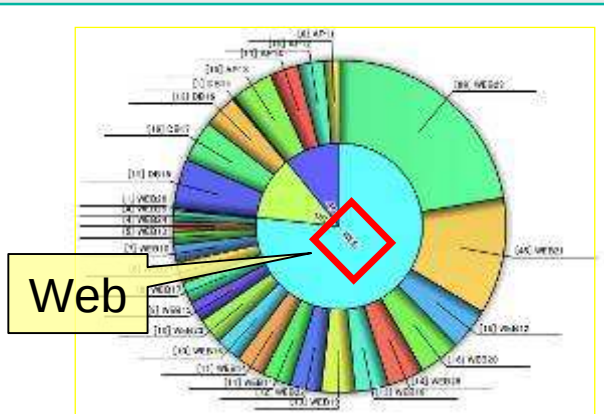
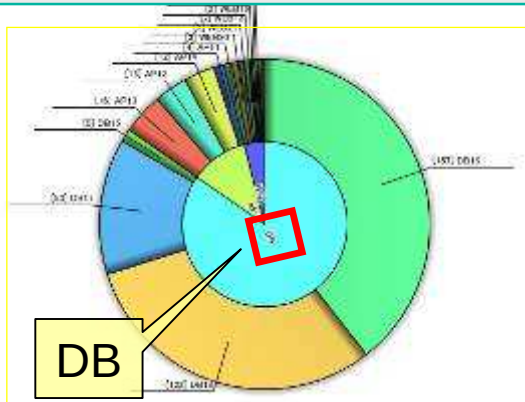
3-2. Visualize Failure Location by Pie Charts

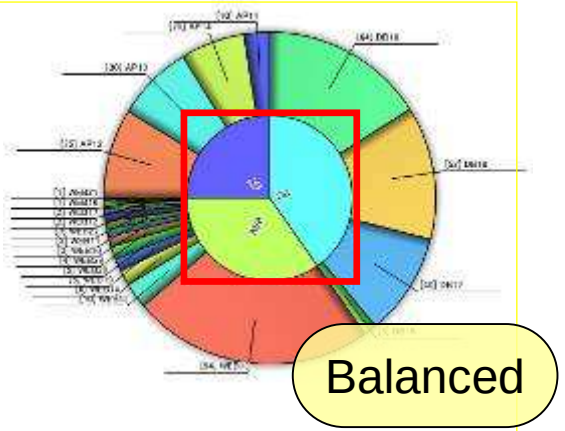
Root cause visualization(3-2)

You can estimate the root cause of Silent Failure easily by pie charts.

For example, these estimations below are possible;







Graph	Many differences are occurring on Web.	Many differences are occurring on DB..	Differences occurring are balanced.
Estimation	Abnormal Web access occurred?	DB server is acting abnormally?	A failure might be occurring on an AP server which effects DB and Web servers.
Facts	Wrong command has been entered to Web server.	Inadequate tuning for DB server has resulted in too many accesses.	An application on AP server has been stalled and occupied CPU.

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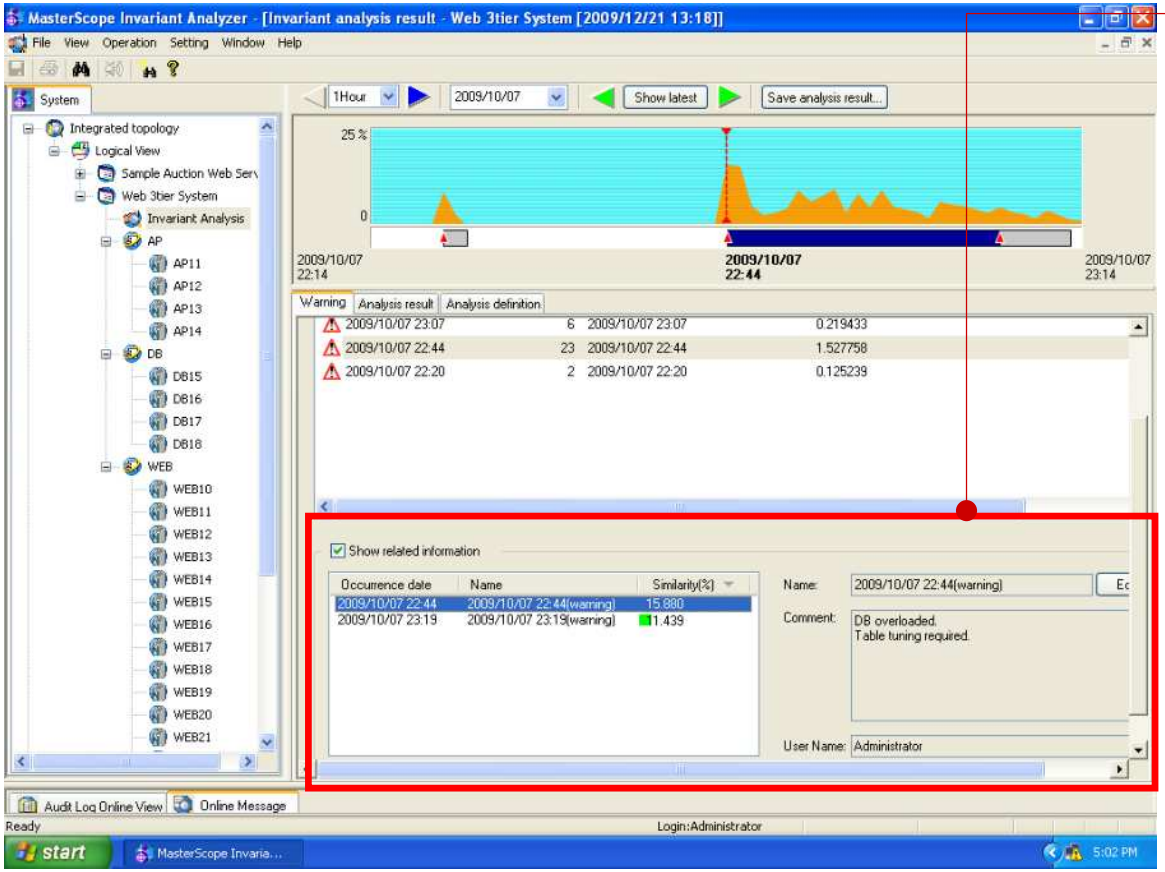
3-3. Knowledge Base

Actions taken in response to each failure can be recorded in knowledge base for future reference.

- By simply referencing to those actions for similar abnormal behaviors in the past, current failures can be readily resolved.



Present records of actions taken in the past.

Shows the similarity between the current failure and previous ones by percentage as well as the action you took in the past.

These actions recorded here will be accumulated in the knowledge base for future reference.

Eliminate time to search for the action and accelerate failure resolution!!

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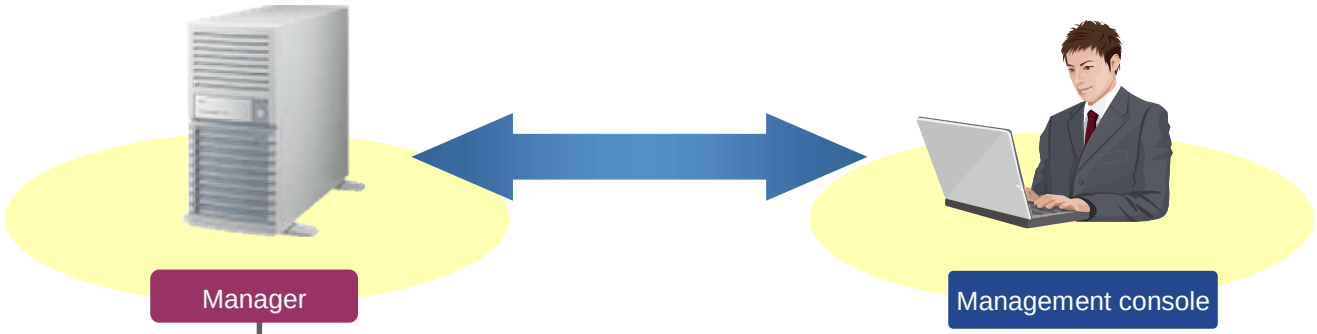
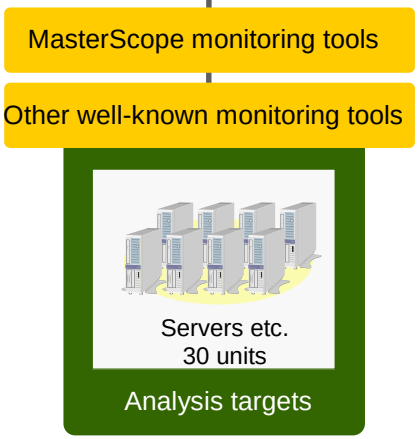
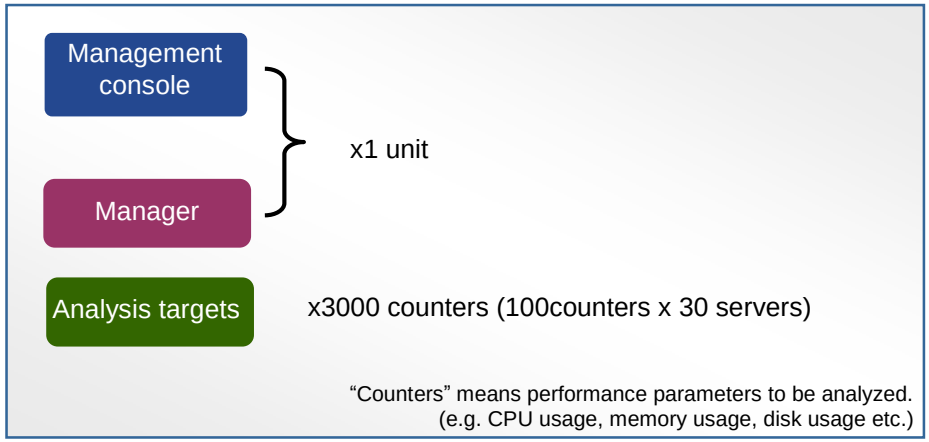
Product Information

4-1. Configuration Example



Input performance data from monitoring tools.





List price :130,000 USD
(Including Manager, Management console and 5000 counters)
Contact us for the prices in other currencies.

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4-2. System Requirements

For Manager and Management console

CPU	Manager	Intel Dual Core Xeon and successions, or equivalent processors
	Management console	Intel Dual Core2 and successions, or equivalent processors
Minimum memory size	Manager	2GB
	Management console	128MB
Minimum disc size	Manager	1GB
Screen size	Management console	More then 1024 x 768 pixels
OS	Manager	Windows Server 2008 Windows Server 2003 SP2 or R2 SP2
	Management console	Windows Server 2008 Windows Server 2003 SP2 or R2 SP2 Windows XP Professional SP3 Windows Vista Business SP2

*Regarding analysis target, Invariant Analyzer also supports operating systems such as UNIX, Linux, etc.
Contact us for the detail.

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Summary: Invariant Analyzer

A performance analysis software which can…

- Detect and diagnose Silent Failures.
- Help you predict and avoid future failures.
- Deliver improved service levels.

NEC's unique technology is leveraged.

- Focusing on the invariants of the performance data.

Please go to the website for the details.

http://www.nec.com/masterscope/invariantanalyzer/

Invariant Analyzer Search

or E-mail to global@soft.jp.nec.com

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