

# WebOTX Application Server

November, 2015

NEC Corporation,  
Cloud Platform Division,  
WebOTX Group





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Every day, our innovative solutions for society contribute to greater safety, security, efficiency and equality, and enable people to live brighter lives.

# Index

## 1. WebOTX Application Server features

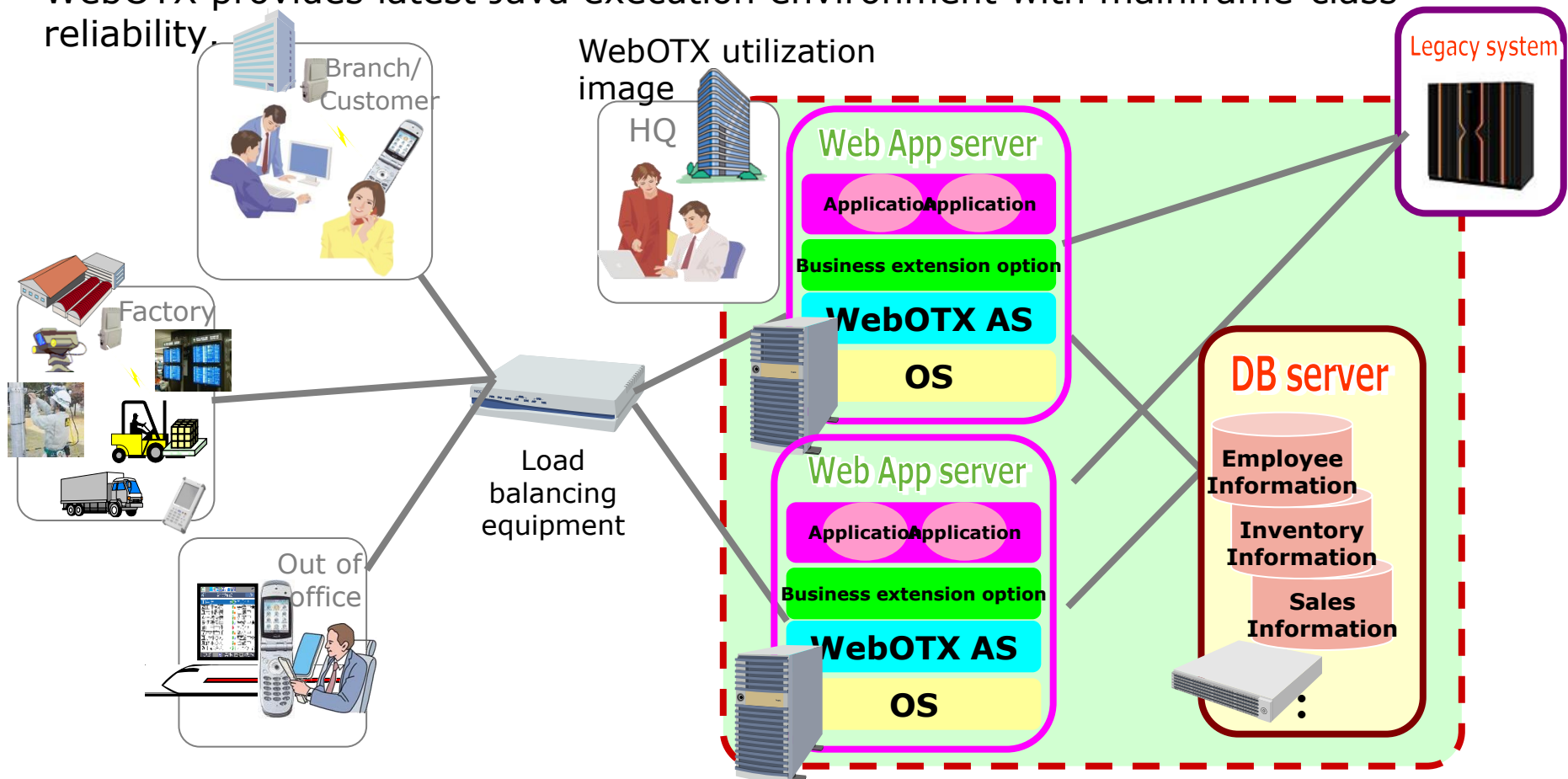
- Features for operability improvement
- Features for reliability improvement
- Features for development easiness

## 2. License and line-up

# What is WebOTX Application Server?

**Java EE5 compliant highly reliable application server enabling 24x7 non-disruptive operation**

“WebOTX Application Server” delivers the “Responsiveness”, “Speed”, and “Reliability” required for enterprise systems in the networked information society. WebOTX provides latest Java execution environment with mainframe-class reliability.



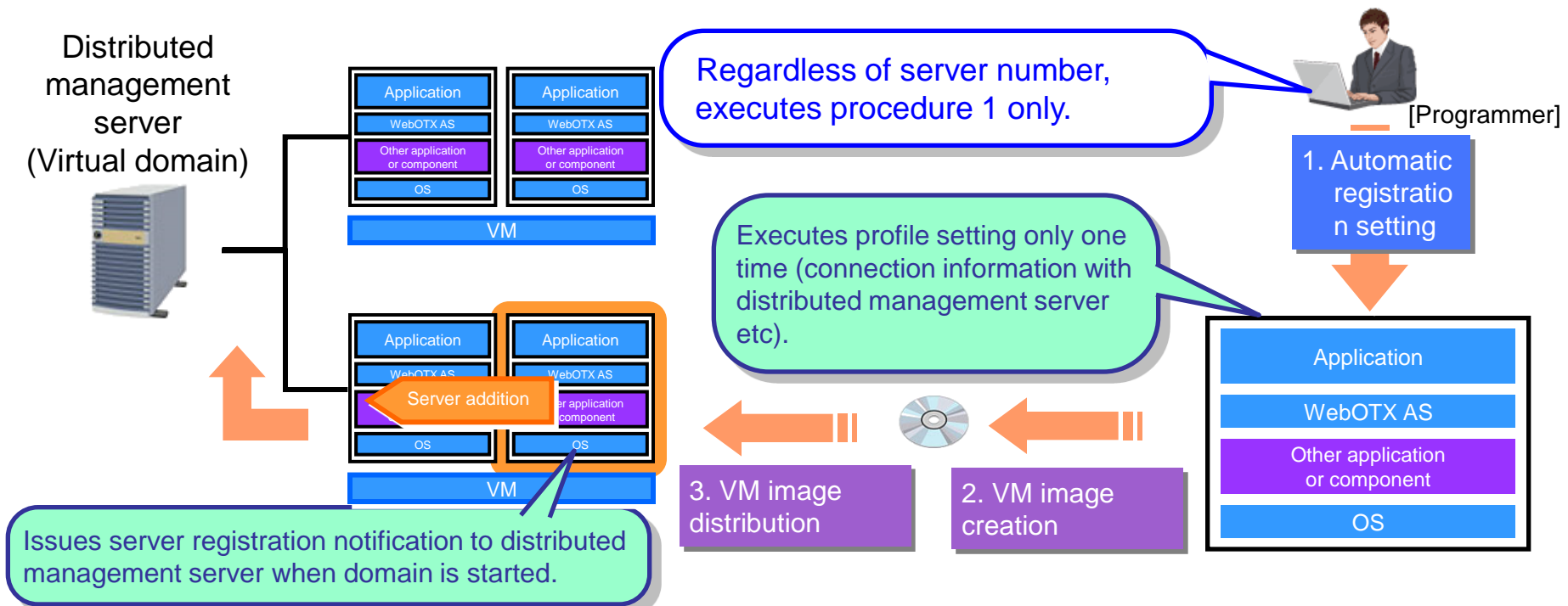
# 1. WebOTX Application Server features

- Features for operability improvement
- Features for reliability improvement
- Features for development easiness

# Automated registration process of setting information

High reliability and availability by easy operation in cloud environment

- One time registration of server information enables automatic registration for server configuration change hereafter.
- Automatic scale out is realized, hence administrator's effort can be reduced



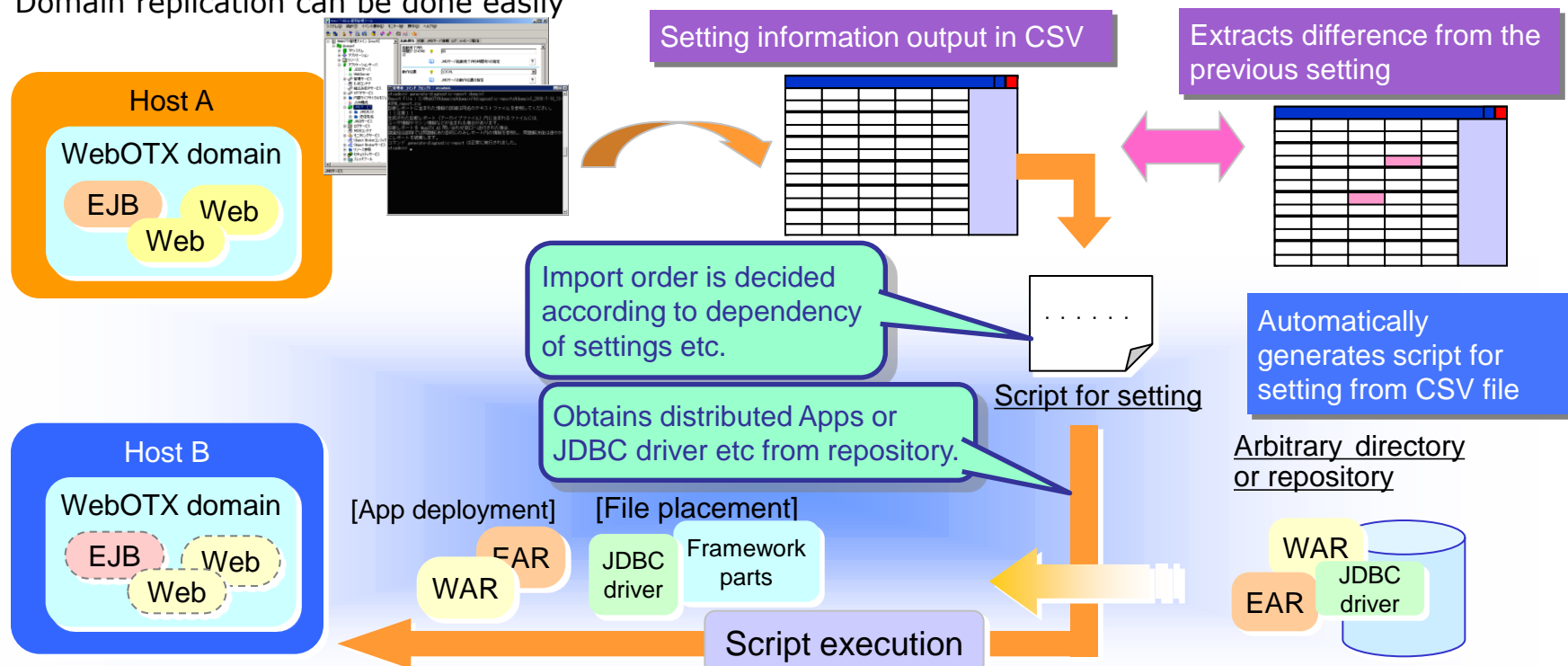
Greatly reduces cloud operation cost

# Setting and app resource import

## Easy system configuration in the cloud environment

Automation of domain environment configuration by setup/script generation feature of domain

- Script generated solving dependency/condition between parameters
- Domain replication can be done easily

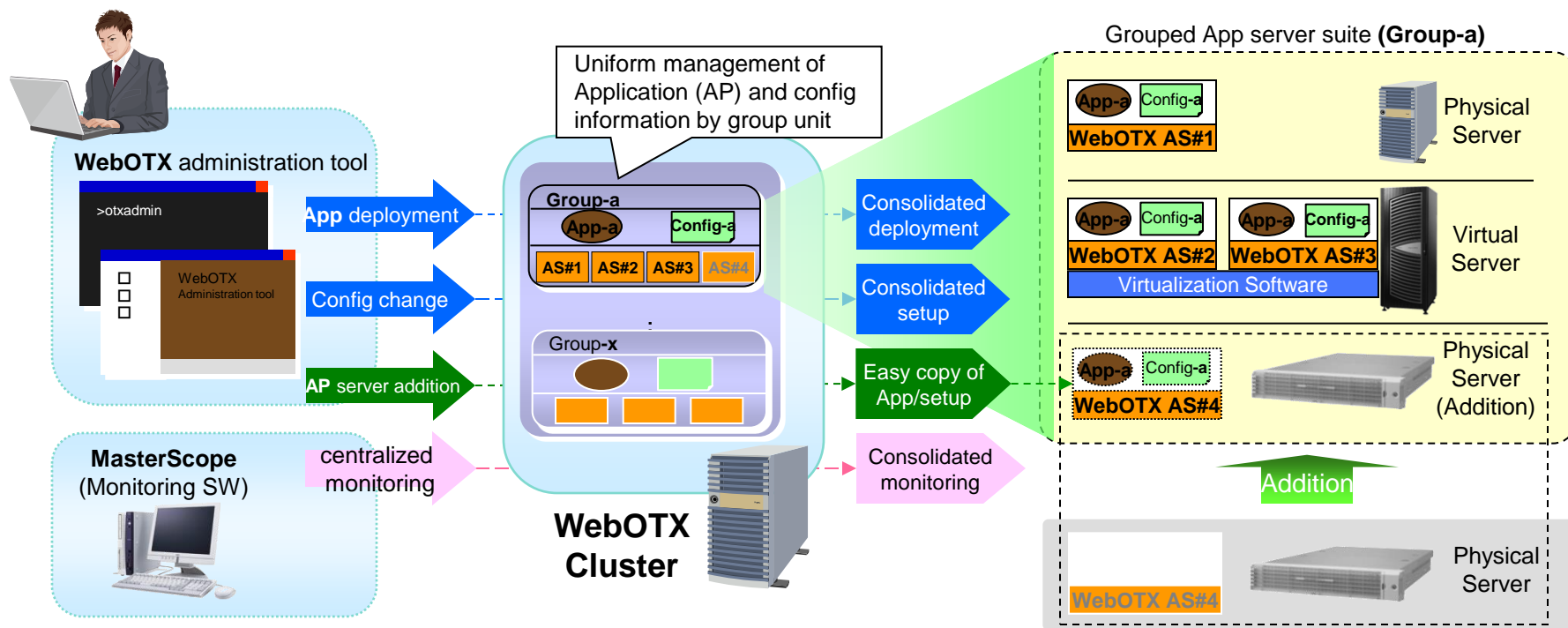


Greatly reduces operation cost by reducing effort for infrastructure construction

# Usability improvement in the cloud environment

## Manage distributed App server suite as single virtualized App server

- Consolidated application deployment and configuration change to all App servers.
- Easy addition of App server for scale out systems.
- Uniform monitoring of App server operating status, and event notification that occurred in App server. Easy integration with monitoring software such as MasterScope products etc.



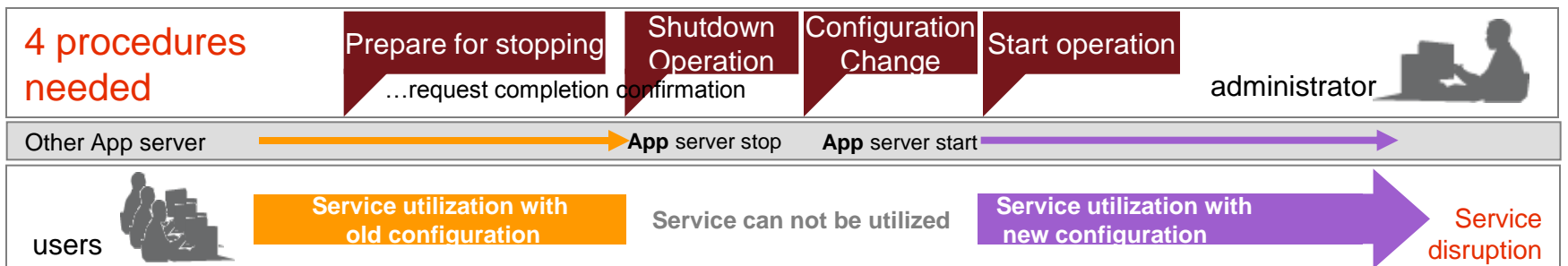
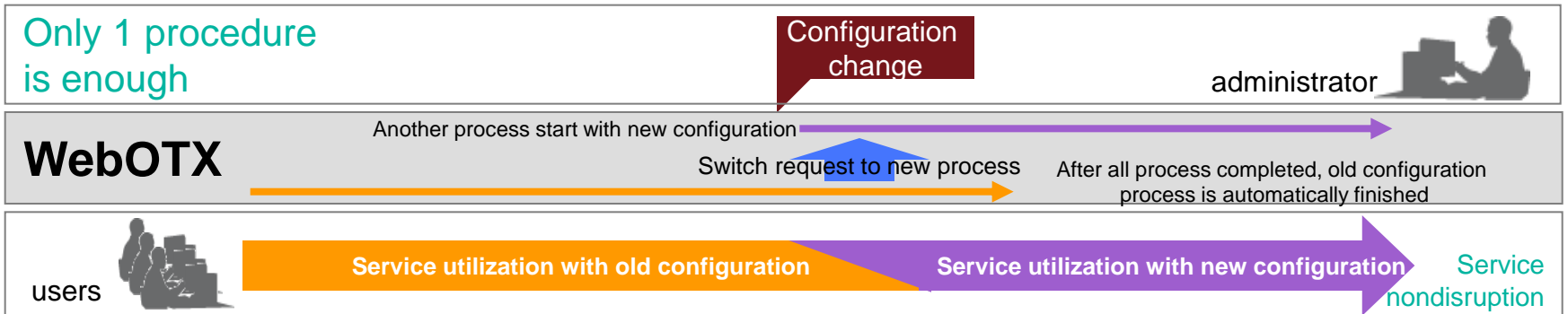
Significant cost reduction for construction/operation  
by uniform management of all servers



# Nondisruptive configuration change

## Availability improvement utilizing parallel process coordination

- Change Java VM option (Java heap size, Java system property, etc) by highly reliable Transaction Processing (TP) monitoring function without shutdown of business operation.
- Administrator's work is reduced as complex administration operation (shutdown operation and executing transaction confirmation, etc) before configuration change is not required.



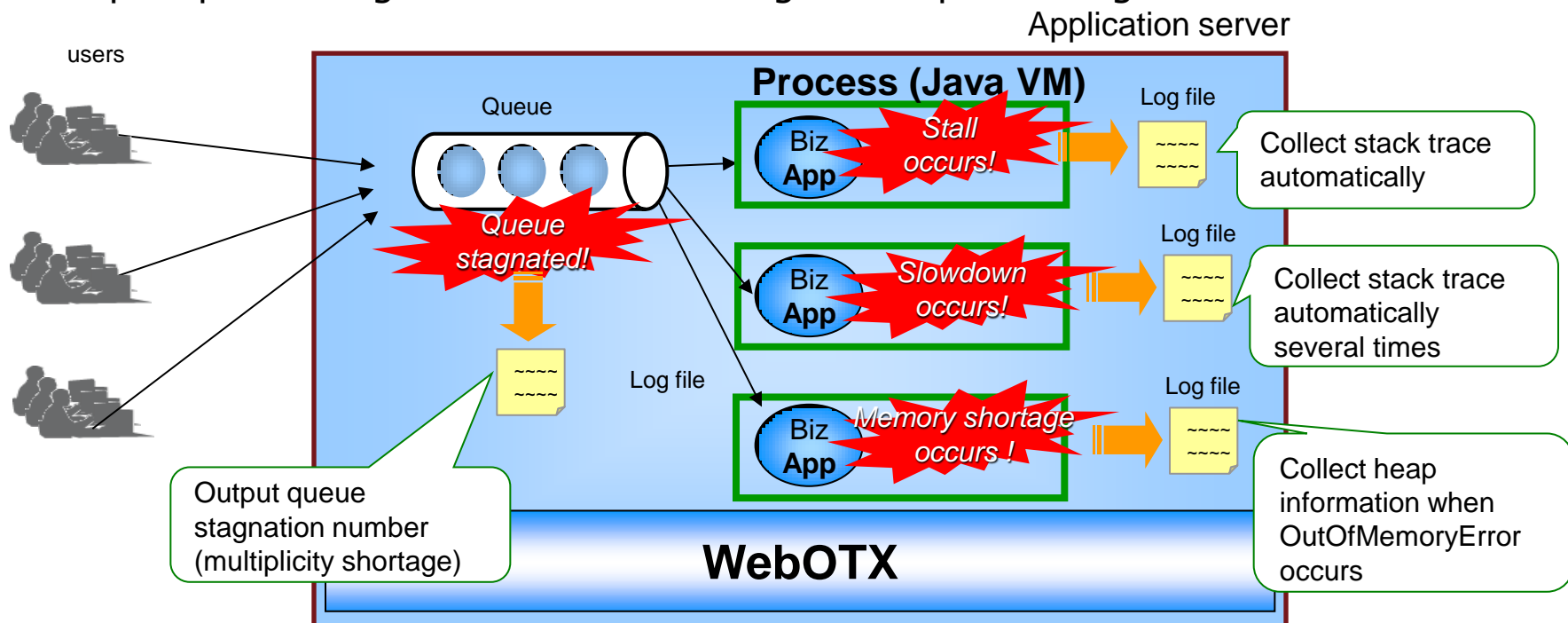
Enables configuration tuning while continuing services

# Failure analysis support (business App monitoring)

Automatic information collecting function in case of failure is enhanced

## Collect failure information automatically

- Collect information in case of abnormal process as well as stall and slowdown
- Output queue stagnation number to log when queue stagnation occurs



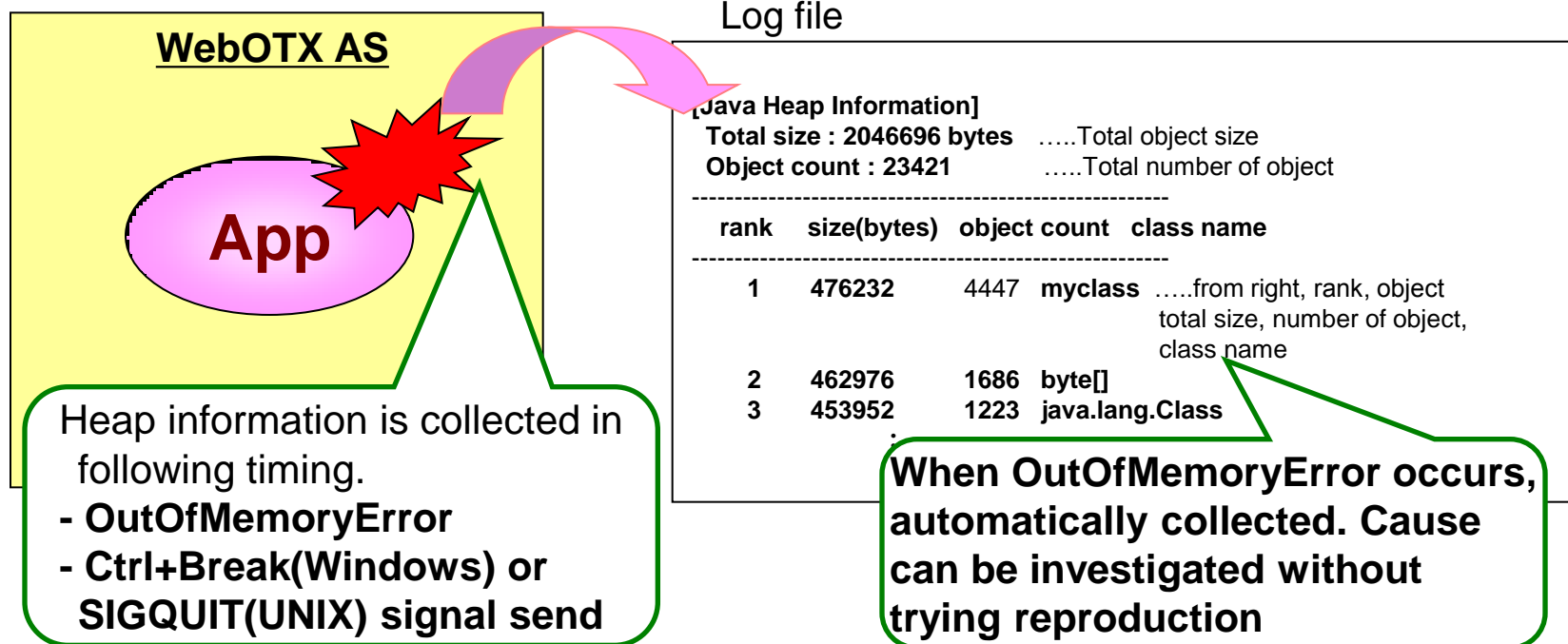
Minimize Need for Problem Replication to Collect Detail Data,  
and rapidly determine failure cause

# Failure analysis support (memory shortage)

Supports rapid investigation of cause of memory leak

Regarding OutOfMemoryError error by memory shortage, which was difficult to be investigated in production environment, collects heap information for investigation. (\*)

- From collected heap information, object of memory leak cause can be specified.



\*: JVMTI feature of J2SE 5.0 is utilized. J2SE 1.4 can not be utilized.

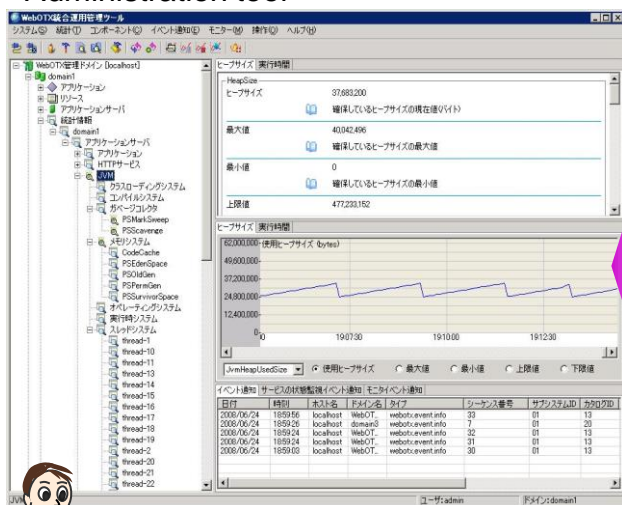
# Failure analysis support (Java VM monitoring)

## Enhanced monitoring feature for Java VM (Java virtual machine)

Memory shortage detection or GC monitoring feature are provided as a WebOTX standard feature.

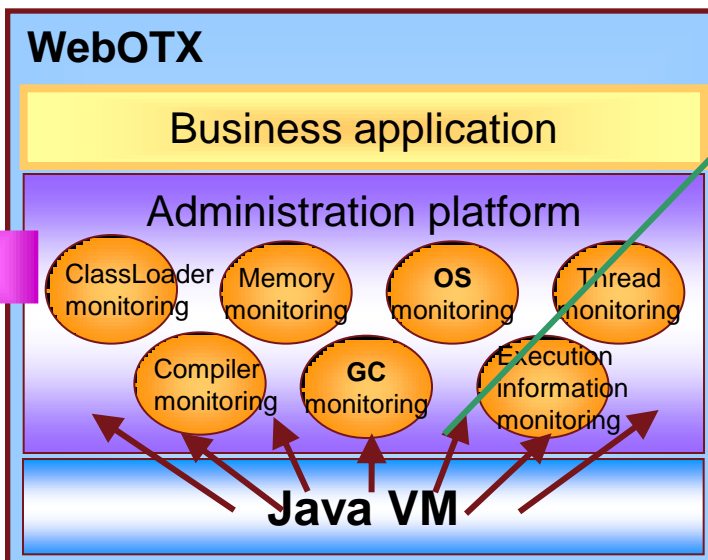
- GC occurrence number and thread dump information can be referred in real time.
- By using administration tool, report can be exported based on detailed status.

Administration tool



Report export by command

Administrator



- Heap consumption
- Execution time
- Memory consumption per area
- GC information
- Thread information
- Parameter information
- .....

●●●:V7

●●●●:V8(new)

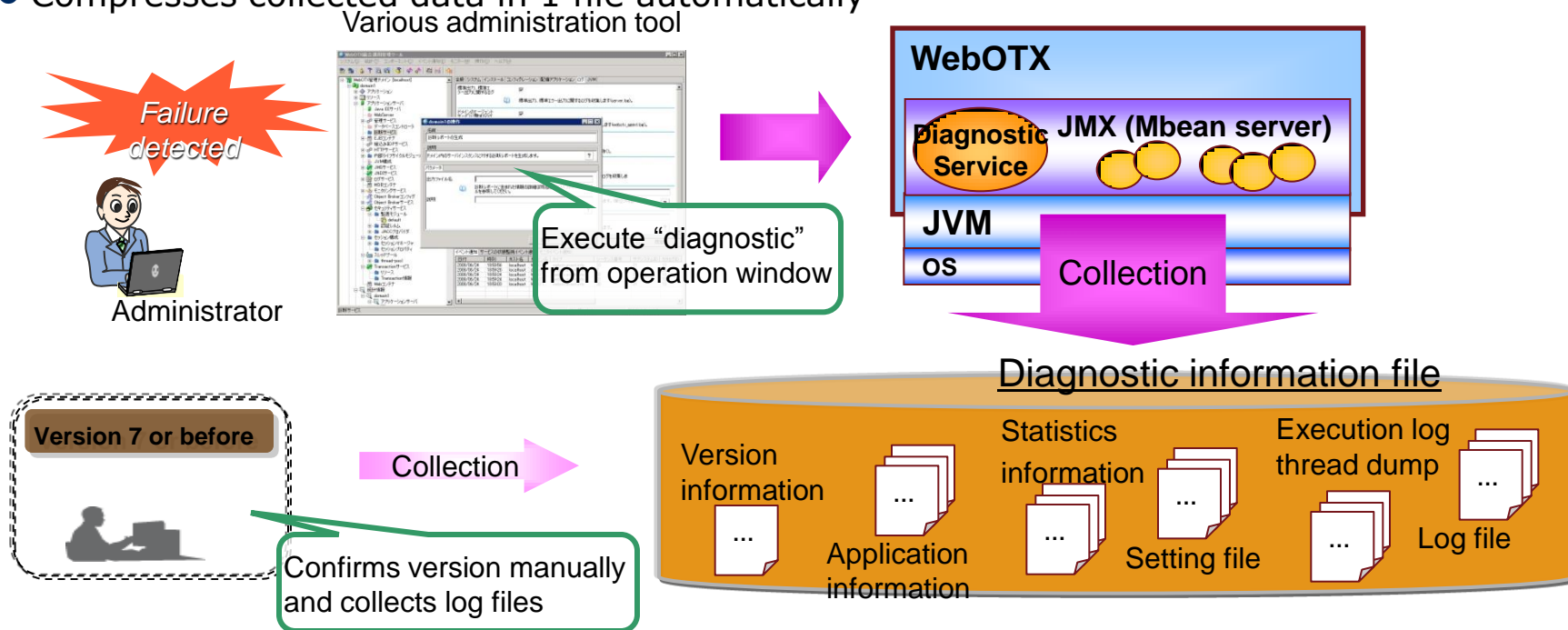
Simplified analysis of bottleneck in Java VM or tuning point

# Failure analysis support (information collection)

## Efficient information collection in case of emerging problems

### Information collection feature for efficient collection during failure

- Automatically collects logs, setting files, etc required for failure analysis with minimum operation
- Compresses collected data in 1 file automatically



Rapidly resolves problem by collecting failure analysis information with easy operation

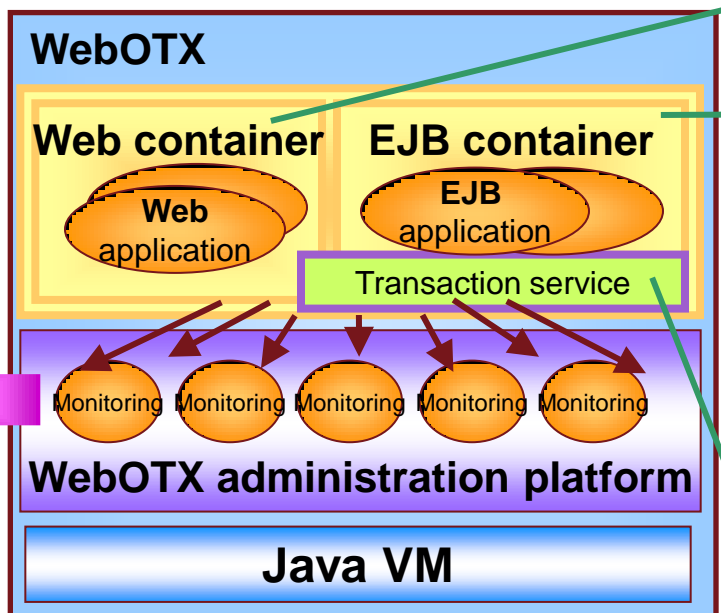
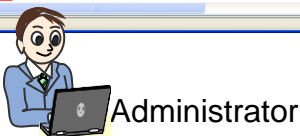
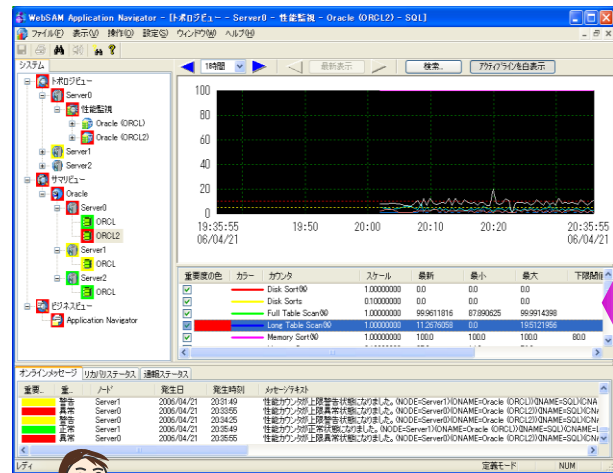
# Failure analysis support (integrated monitoring)

Breaks down monitoring items. Fulfilling monitoring point for tuning.

- Measures application operating status in server in detail
- Seamless integration with administration tool enabling periodical information collection and monitoring

Application monitoring

MasterScope Application Navigator



- Generation/ deletion number
- Execution time/ number
- Execution number
- Session number
- Thread number
- Execution time
- Cumulative processing time
- Data transfer number
- Data transfer rate
- Connection number
- Execution list
- Count number per status
- Commit number per target
- Rollback number per target

By collected information from WebOTX, elaborate tuning is enabled

# 1. WebOTX Application Server features

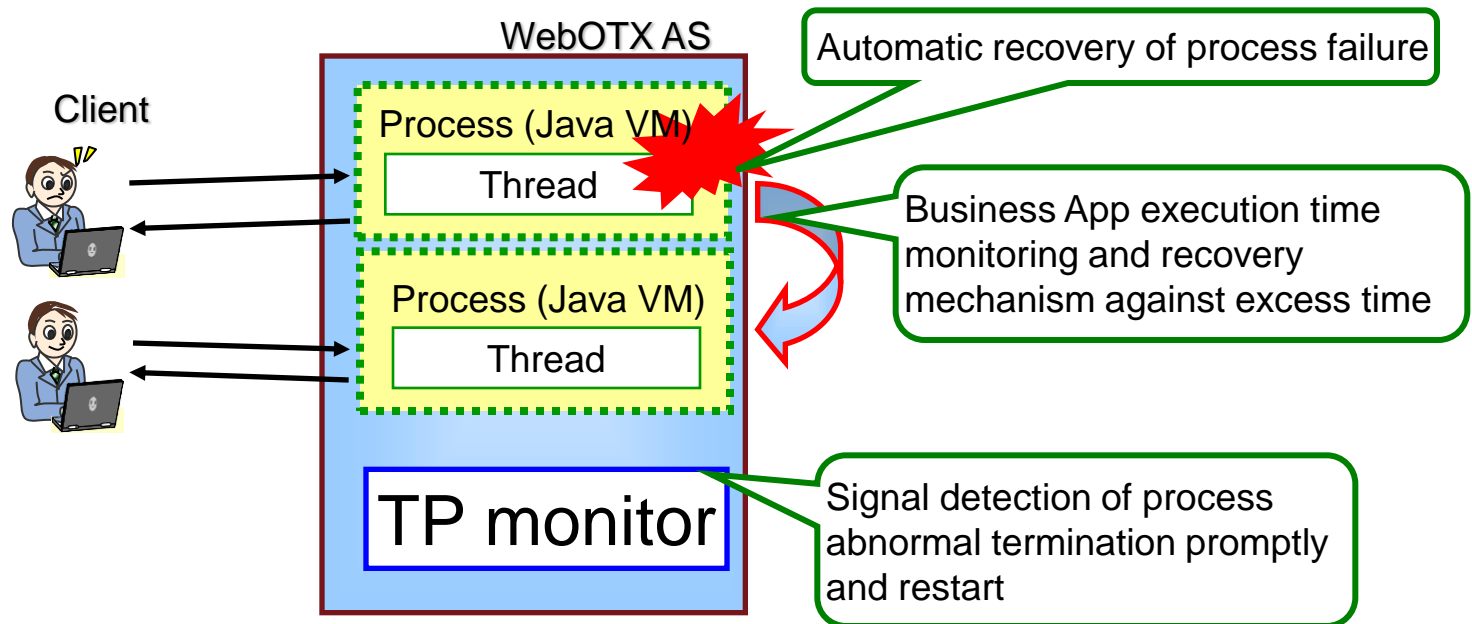
- Features for operability improvement
- **Features for reliability improvement**
- Features for development easiness

# Real time monitoring by TP monitor

Facilitate Application Failure Isolation to minimize affected Business App

TP monitor process that is not existing in other vendor's product is implemented

- System disruption time is minimized by real time monitoring/recovery of abnormal process



Stable operation by system disruption time minimization

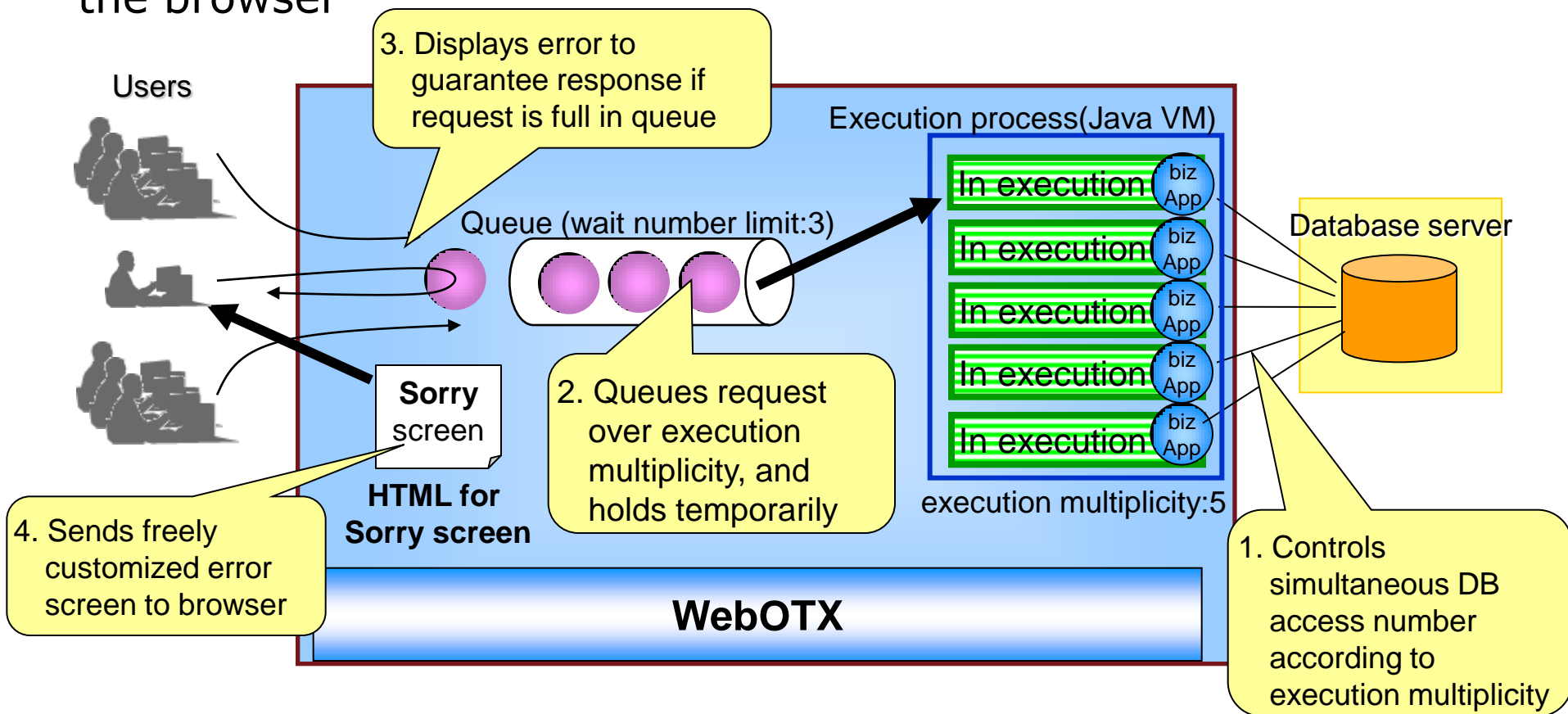


# Queue control

## Properly controls overload request

Controls overload by queue control

If simultaneous processing ability is over, sends Sorry screen to the browser

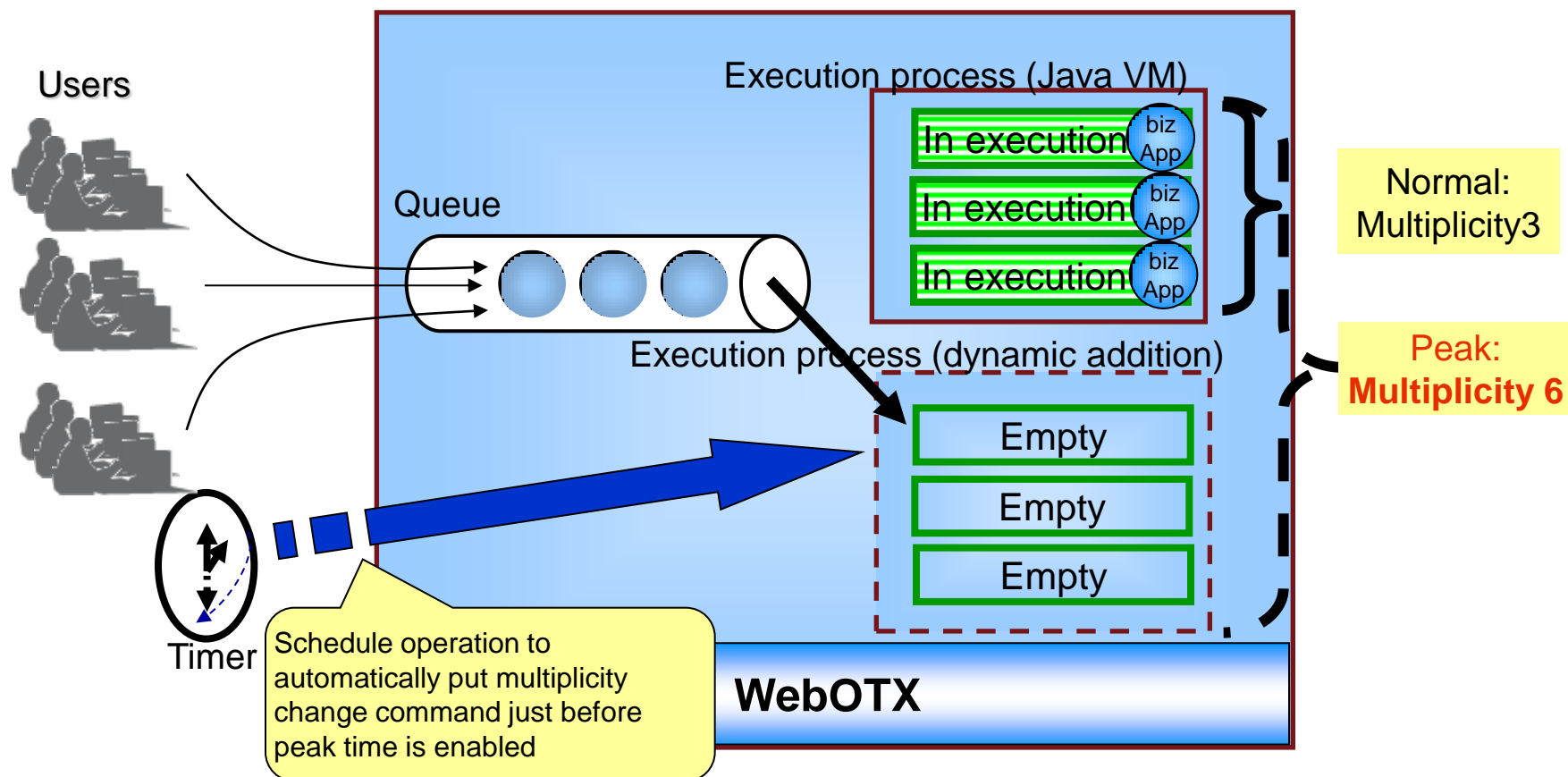


# Process multiplicity setting

Dynamically changes multiplicity according to flow changing time to time

Dynamic change of execution multiplicity (request number) by command

- Ensures response by increasing request in peak time



# Priority control

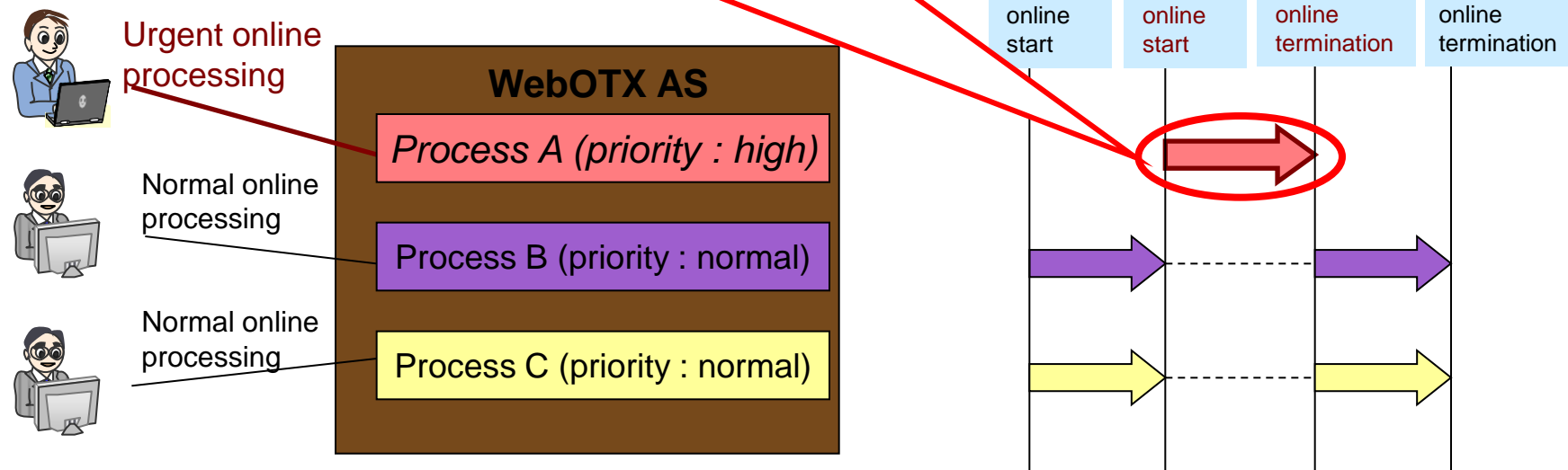
Guarantees response in heavy load by priority control of process

Controls CPU allocation priority in OS level

Detailed setting such as priority change on peak time is enabled

Start immediately because high priority process is prior to others

\*:Not supported in Linux



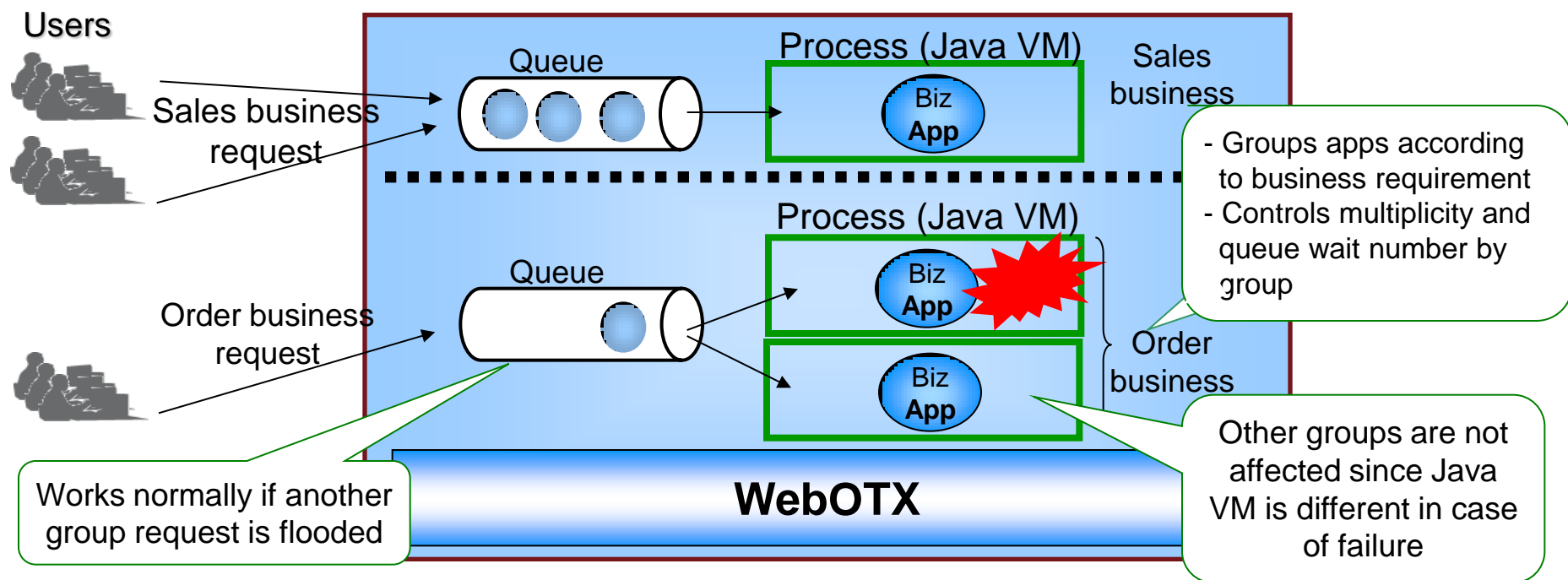
App server of other vendors can not enable priority control

# Process grouping

Makes business application isolated to minimize affected Business App

Groups application according to business characteristics

- Realizes independent operation by running on different Java VM
- Other app groups are not affected in case of failure



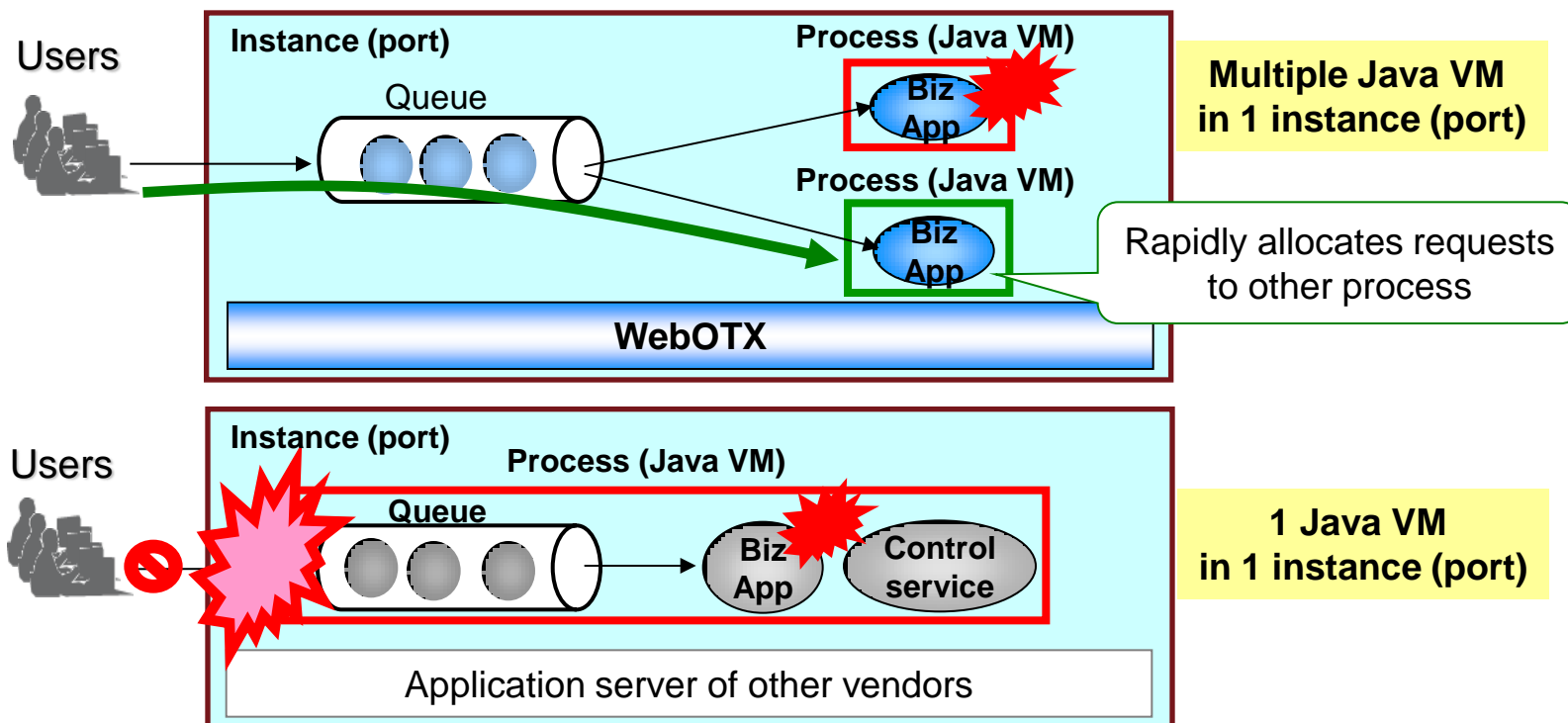
App server of other vendors spreads failure/delay to whole instance

# Multiple Java VM (1/2)

## Minimizes Java VM failure and continues business

### Advantages of "1 instance (port), multiple Java VM" implementation

- When Java VM aborts, continues business without instance stoppage
- Wait requests in queue are not affected in case of failure



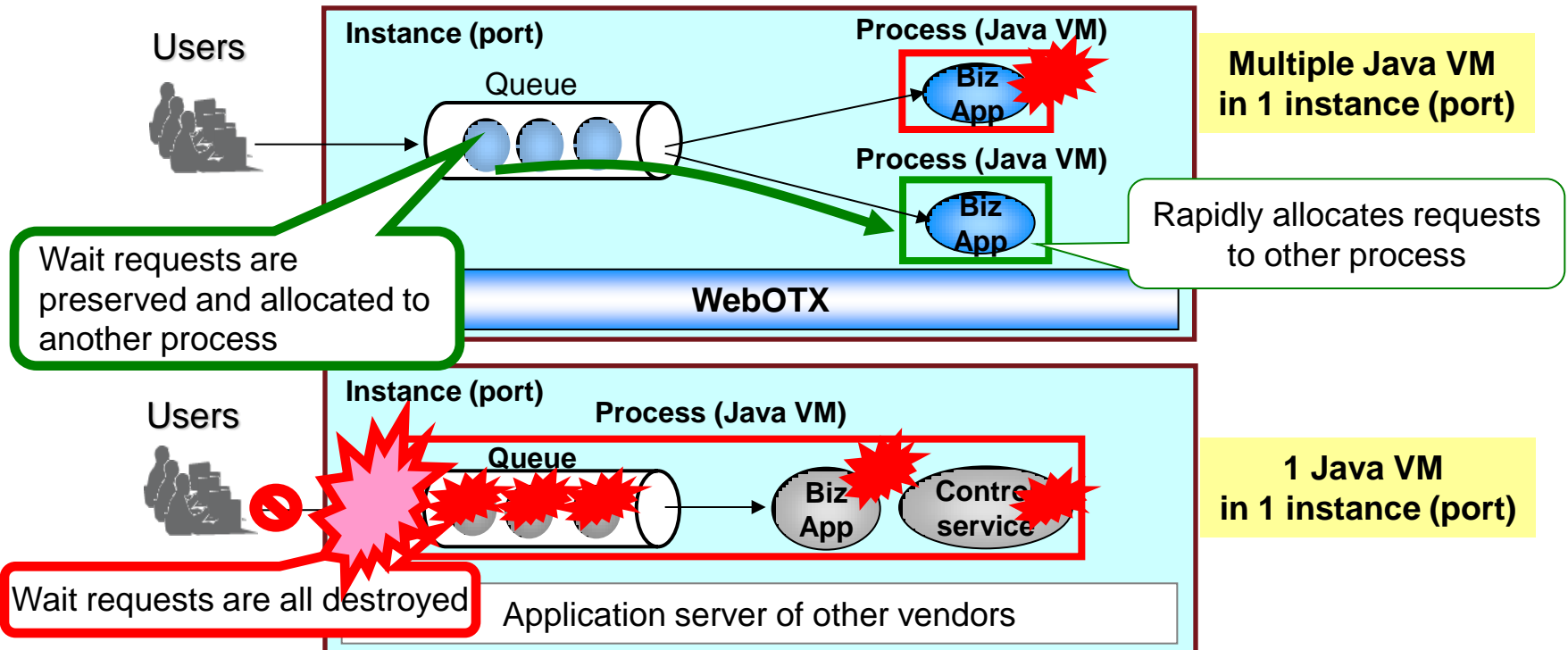
App server of other vendors cause instance stoppage due to Java VM failure, leading to server fallback

# Multiple Java VM (2/2)

## Minimizes Java VM failure and continues business

### Advantages of "1 instance (port), multiple Java VM" implementation

- When Java VM aborts, continues business without instance stoppage
- Wait requests in queue are not affected in case of failure



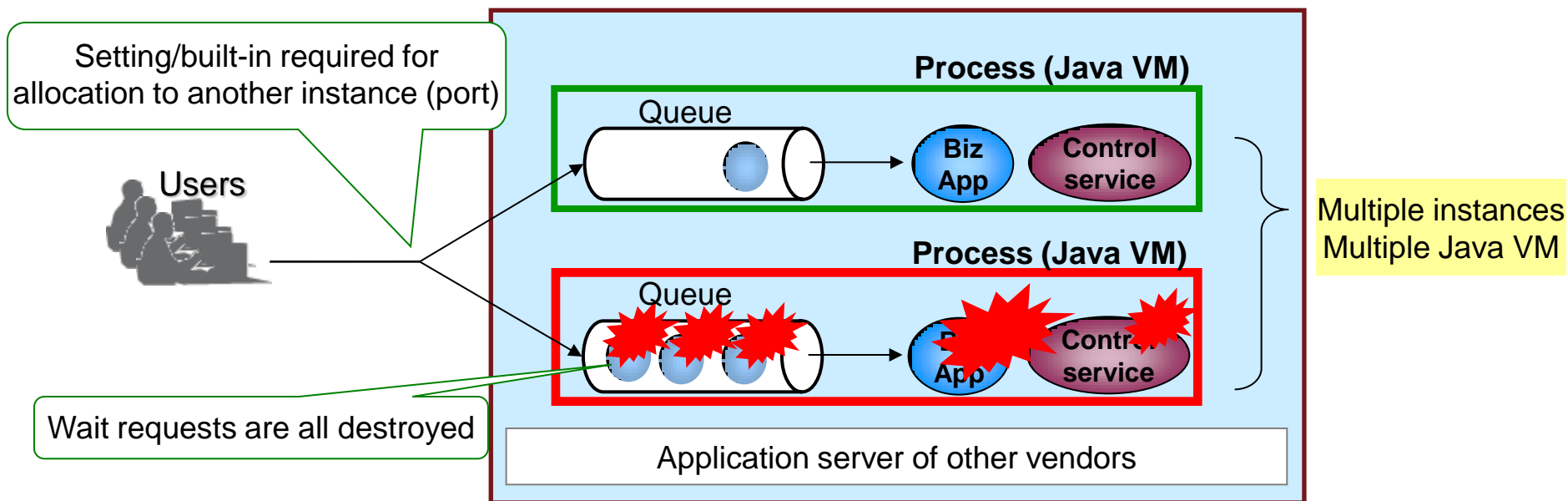
In app server of other vendors, requests in queue are all destroyed

# Multiple Java VM (reference)

Realizes configuration near to WebOTX by using multiple instances

Limited reliability/availability improvement despite SI effort

- Wait requests in queue are not saved even with multiple instances
- Logic setting of instance allocation (including operation during failure) is required
- Required time for failure detection is not shortened



# Order guarantee of redelivery JMS message

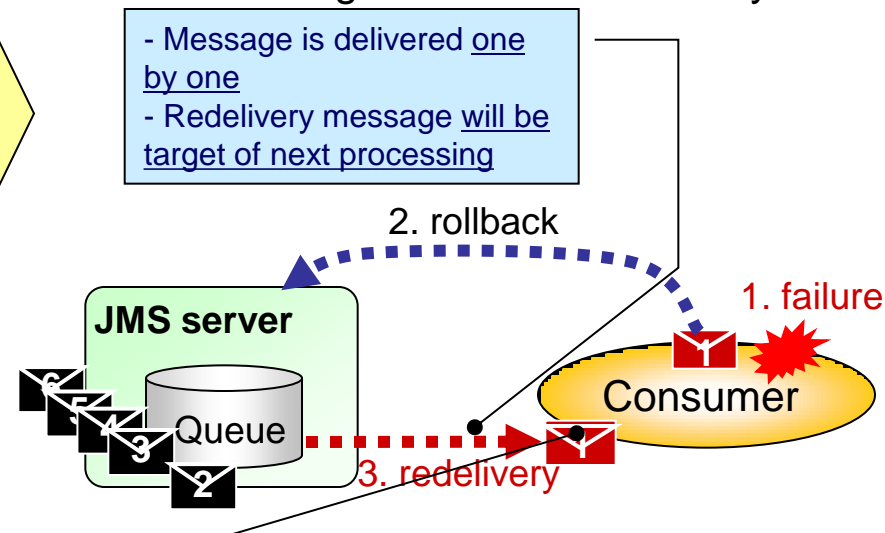
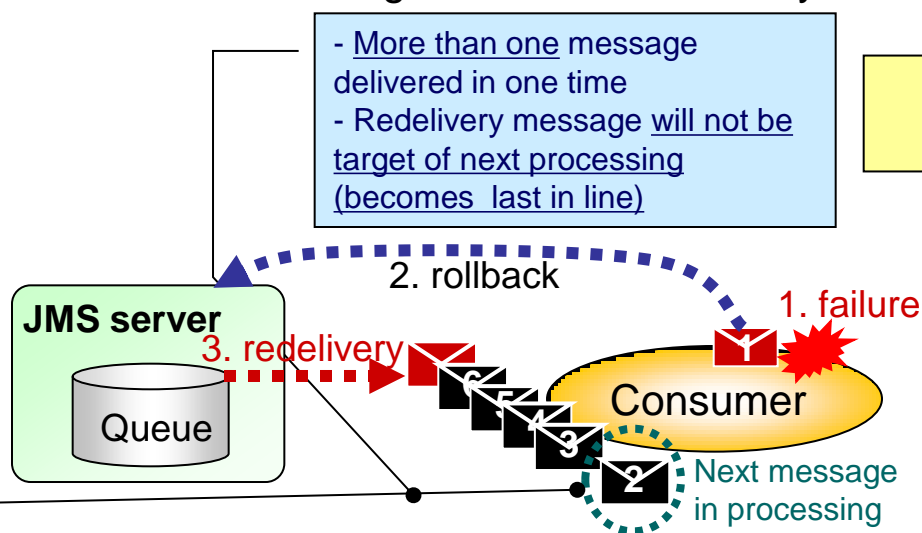
Processing for message order guarantee with application is not required

In addition to normal delivery, provides order guarantee of redelivery

- System with higher reliability can be configured
- Application built-in is not required for order guarantee in case of failure
  - Without order guarantee of redelivery
  - With order guarantee of redelivery

- More than one message delivered in one time  
- Redelivery message will not be target of next processing  
(becomes last in line)

- Message is delivered one by one  
- Redelivery message will be target of next processing



Following built-in is required.  
- Continues rollback until message 1 is redelivered.  
- Keeps all messages until redelivery of message 1.  
- Requests redelivery to server, and revokes messages after this.

Processing for guaranteeing message order is not required!

Guarantees order of redelivery not specified in JMS standard specification

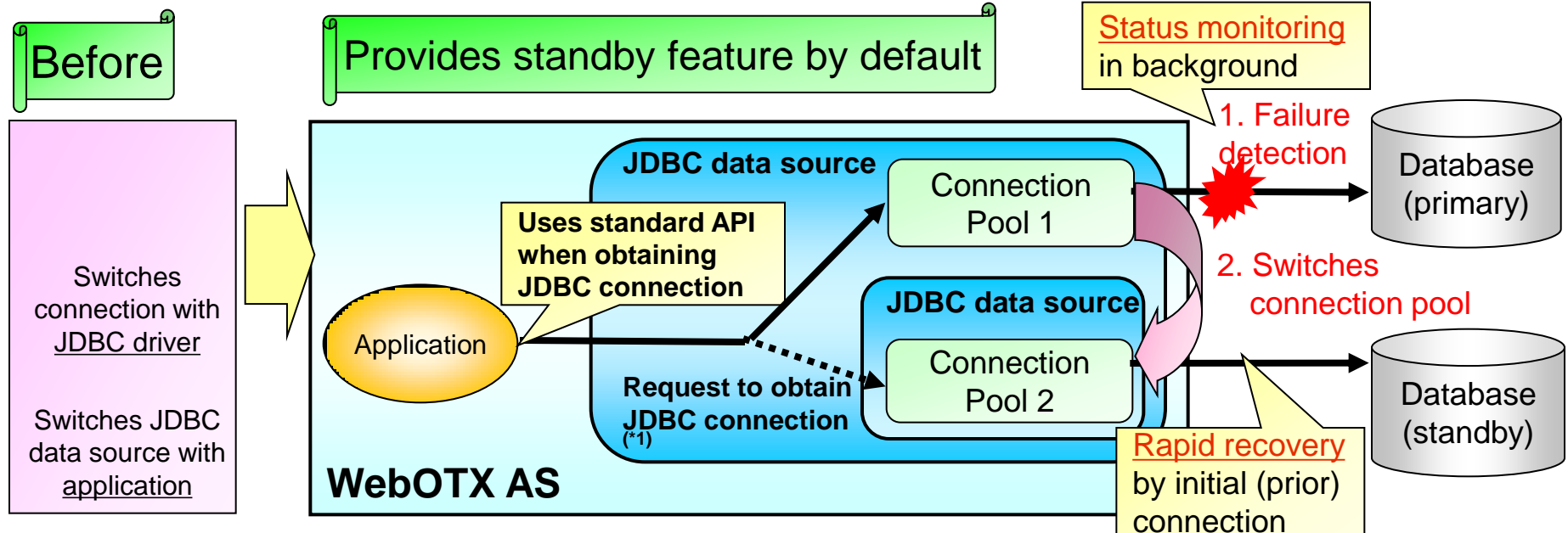


# Cluster control feature of JDBC connection pool

Improves availability of database connection

Provides standby/load balancing feature of JDBC connection pool

- Hides connection failure, and rapidly recovers from database server failure
- In load balancing feature, switches connection pool every time when JDBC connection is obtained, and do load balancing equally (weighting is possible)



Availability is improved by cluster control feature which is not depending on database

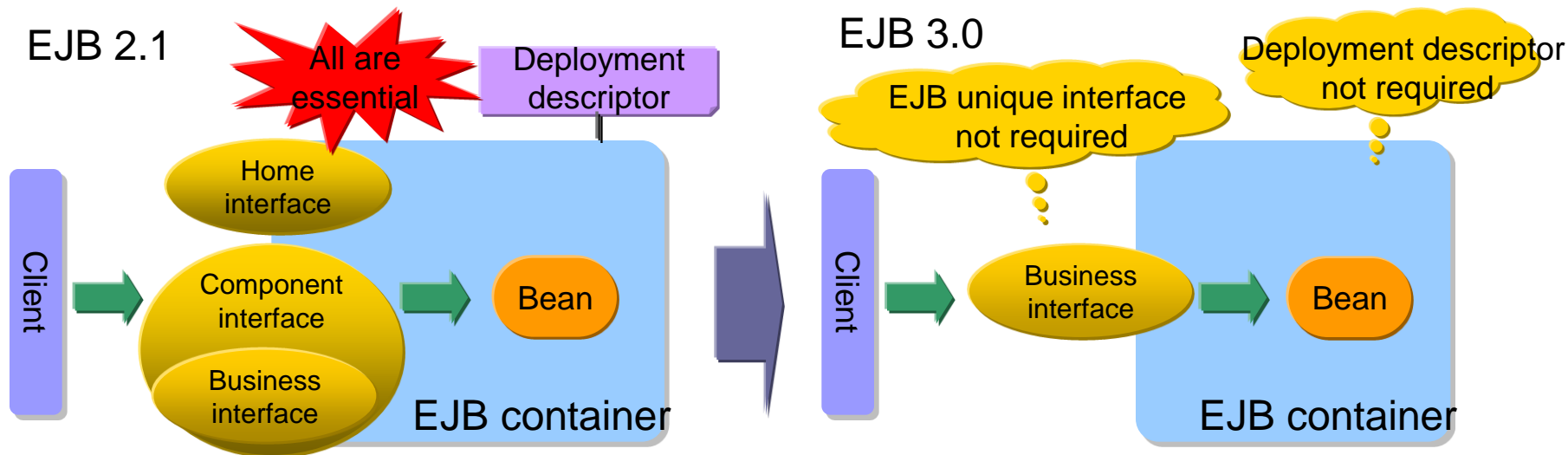
\*1: License for standby is required

# 1. WebOTX Application Server features

- Features for operability improvement
- Features for reliability improvement
- Features for development easiness

### Simplified programming model without deployment descriptor

- EJB unique interface no longer have to be constructed. In business logic part, it is implemented as a plain old Java object (POJO).
- Complex deployment descriptor causing description mistakes is not required.
- Code (log output code, etc) which was traditionally required to be implanted in lots of business logic part can be injected without changing business logic.
- EJB container traditionally used for examining EJB is not required.



Only Java knowledge is required to implement EJB business logic

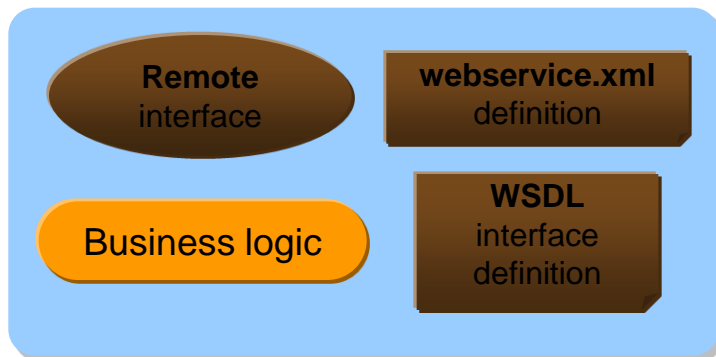
### Provides more free web service with support for JAX-WS 2.0

Compared to the web service before, various features are added to expand coverage area

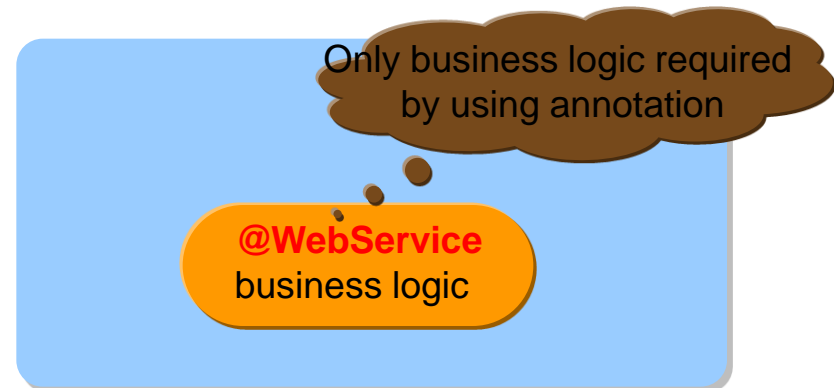
- Provides perfect mapping to Java code of all XML styles
- Supports asynchronous execution
- Provides interrupt processing enabling to enter in communication of all protocols and ports
- Realizes higher speed communication by optimization of message transfer

Definition file with tricky and long description is not required thanks to annotation

#### Before (JAX-RPC 1.1)



#### Java EE 5 (JAX-WS 2.0)

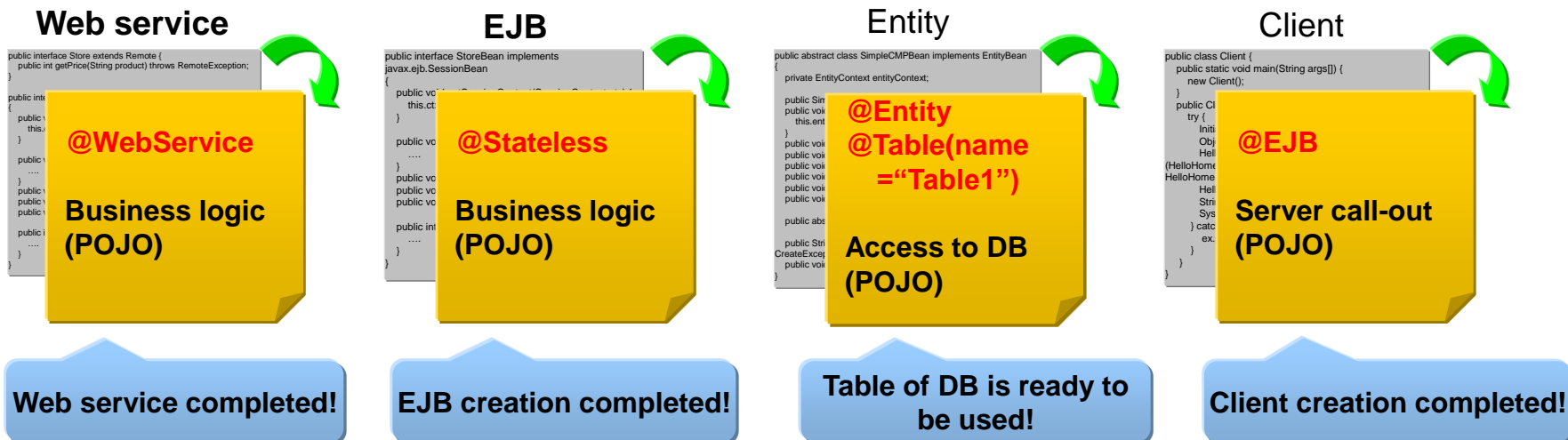


### Business logic made by POJO from implementation of annotation

By implementing annotation, following components will be made by POJO. As a result, code is largely reduced.

**-POJO-** *Java object which is not limited by any rule and framework.  
Can be implemented with **Java knowledge only***

\*Webservice \*EJB \*Entity \*Client



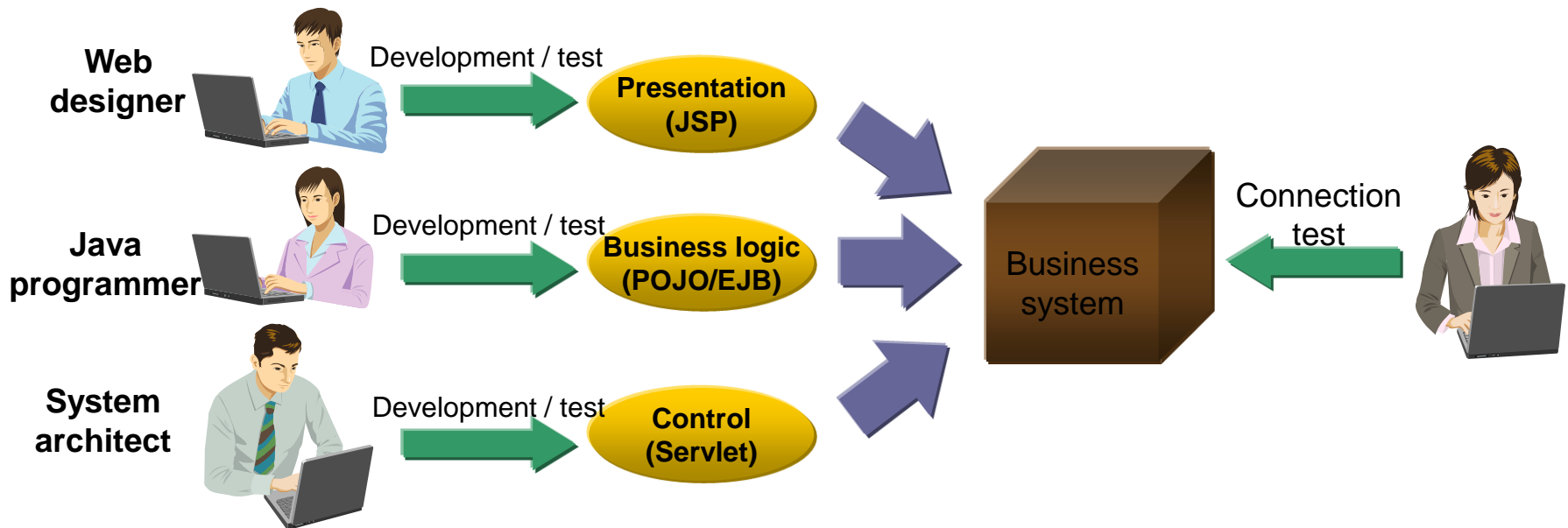
Everyone can easily develop and examine it

# Productivity improvement with Java EE 5

## - Parallel development is promoted -

Enabled parallel development through development and test by excluding dependency between components

- In Java EE 5, web application framework JSF is supported as a standard
- JSF enhances independency of three components, presentation, business logic, control, enabling parallel development of each expert
- Technologies used by each component is freely changed



Productivity is improved by promoting parallel development

## 2. License and line-up

# WebOTX Application Server product information

Product name	Details	Type
WebOTX Media	WebOTX installation media	
WebOTX Application Server Express	Express edition	Server
WebOTX Application Server Foundation	Foundation edition	CPU
WebOTX Application Server Foundation CPU License	Foundation additional CPU license	CPU
WebOTX Application Server Foundation Virtual CPU License	Foundation additional virtualization CPU license	CPU
WebOTX Application Server Standard	Standard edition	CU
WebOTX Application Server Standard CU License	Standard additional CU license	CU
WebOTX Application Server Standard Virtual CU License	Standard additional virtualization CU license	CU
WebOTX Application Server Standard for Standby System	Standard edition (standby)	CU
WebOTX Application Server Standard for Standby System CU License	Standard additional CU license (standby)	CU
WebOTX Application Server Standard for Standby System Virtual CU License	Standard additional virtualization CU license (standby)	CU
WebOTX Application Server Enterprise	Enterprise edition	CU
WebOTX Application Server Enterprise CU License	Enterprise additional CU license	CU
WebOTX Application Server Enterprise Virtual CU License	Enterprise additional virtualization CU license	CU
WebOTX Application Server Enterprise for Standby System	Enterprise edition (standby)	CU
WebOTX Application Server Enterprise for Standby System CU License	Enterprise additional CU license (standby)	CU
WebOTX Application Server Enterprise for Standby System CU License	Enterprise additional virtualization CU license (standby)	CU
WebOTX Developer	WebOTX development environment	Server
WebOTX Administrator	WebOTX administration environment	Server

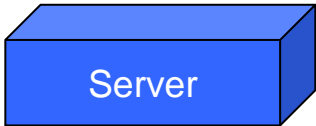
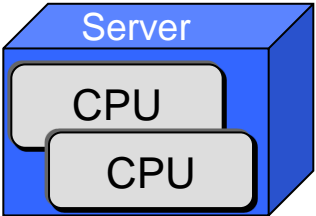
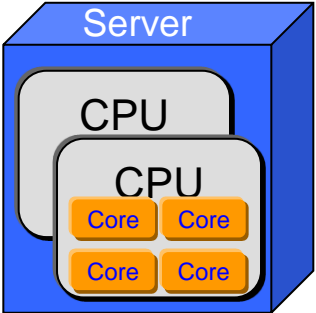
Please see WebOTX website for support platform information.  
<http://www.nec.com/global/prod/webotx/>

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# WebOTX Application Server Line-up

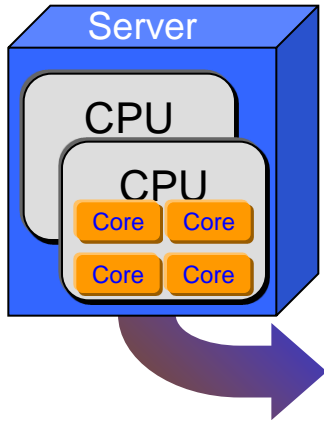
Select appropriate product according to system scale

License	Edition	Unit	Note
Server unit	WebOTX Application Server Express		For small scale system. High speed Java EE execution environment compared to OSS at reasonable price. GUI based administration environment.
CPU unit	WebOTX Application Server Foundation		For small/middle scale system. Simple and highly reliable system at a low price. Automatic recovery feature of SW failure is deployed as a standard.
CU unit	WebOTX Application Server Standard		For middle/large scale system. Highly reliable and available system for strict demand for reliability. Cost advantage at multiple cores CPU usage. <b>(Same price for 2 cores through 8cores per 1 CPU)</b>
CU unit	WebOTX Application Server Enterprise		Sophisticated platform for huge scale system. Lower price than other vendors' when multiple core CPU is used. <b>(Same price for 2 cores through 8cores per 1 CPU)</b>

# (Reference) WebOTX Application Server License

Sample)

How to count the license in 1Server / 2CPU / 4cores model



License	WebOTX Application Server	Server	CPU	Core
Server unit	Express	1		
CPU unit	Foundation	1	✗ 2	
CU unit	Standard	1	✗ 2	
CU unit	Enterprise			✗ 2

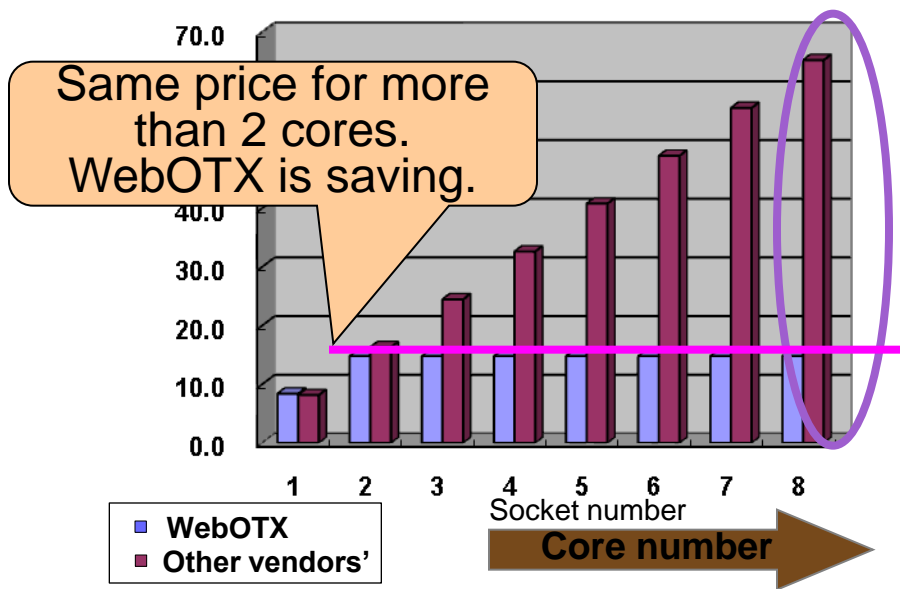
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# License system reasonable for multiple core CPU

Overwhelming cost performance beyond the other vendors (Standard/Enterprise)

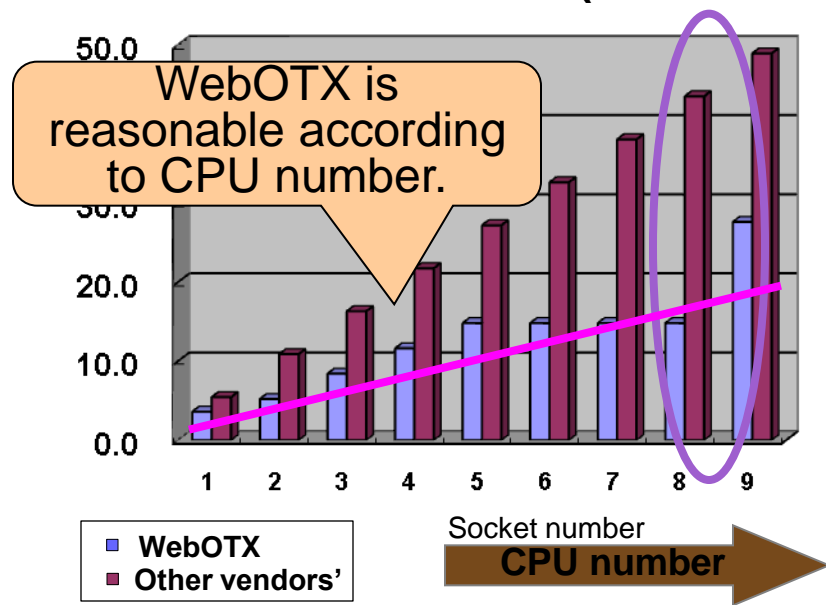
- Same price for 2 cores through 8 cores (Please consult if more than 9 cores machine is used). More reasonable according to core number.
- Price increase is moderate according to CPU number. More saving if CPU number is increased.
- Low cost infrastructure for large scale system.

**In case of core increase (6 CPU case)**



**1/4 of other vendor at 8 cores / 6CPU case !**

**In case of CPU increase (4 cores case)**



**1/3 of other vendor at 4 cores / 8CPU case !**

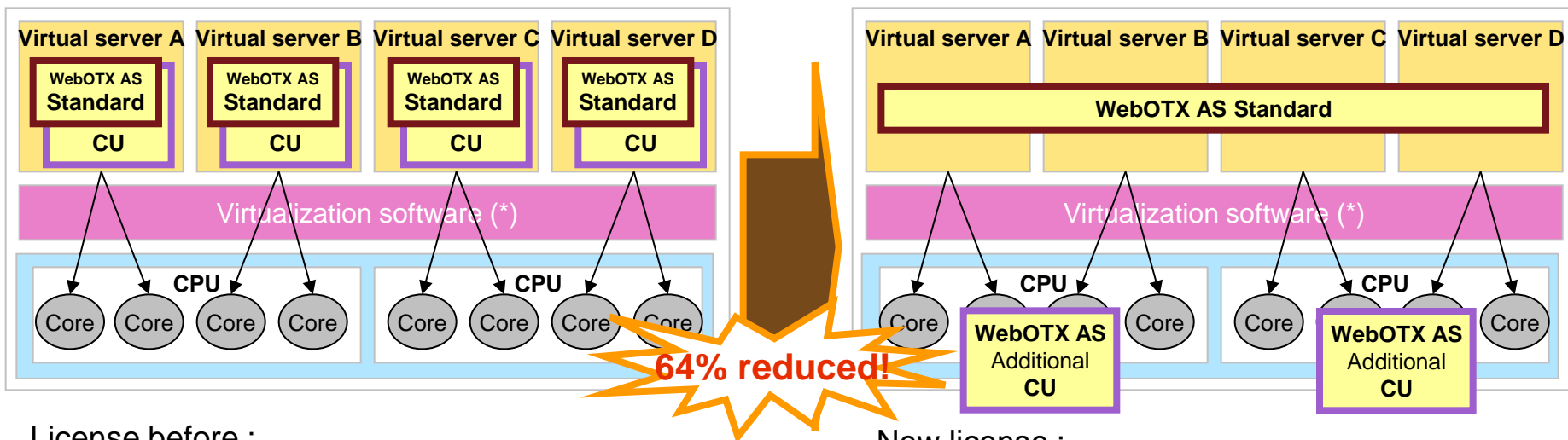
# Virtualization License

License based on physical server which is not affected by virtual server number

- Basic license according to physical server regardless of virtual server
- Additional license according used CPU in physical server unit
- Additional license can be used commonly in Windows/Linux

(\*Operation of VMware and Hyper-V is verified)

E.g.) In case of 4 virtual servers consolidated in 1 physical server of 2CPU quad core, and allocates 2 cores for each virtual server. **(WebOTX AS Standard)**



License before :

Standard license (4) + Additional CU license (4)

New license :

Standard license (1) + Additional CU license (2)

Not only HW but SW license can reduce the cost by virtualization

# Thank You

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# WebOTX

Application Service Platform for the age of cloud-computing

For more product information & request for trial license,  
visit >> <http://www.nec.com/webotx/>

For more information, feel free to contact us - [global@soft.jp.nec.com](mailto:global@soft.jp.nec.com)

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