

# MasterScope JobCenter Introduction of Controlling AWS

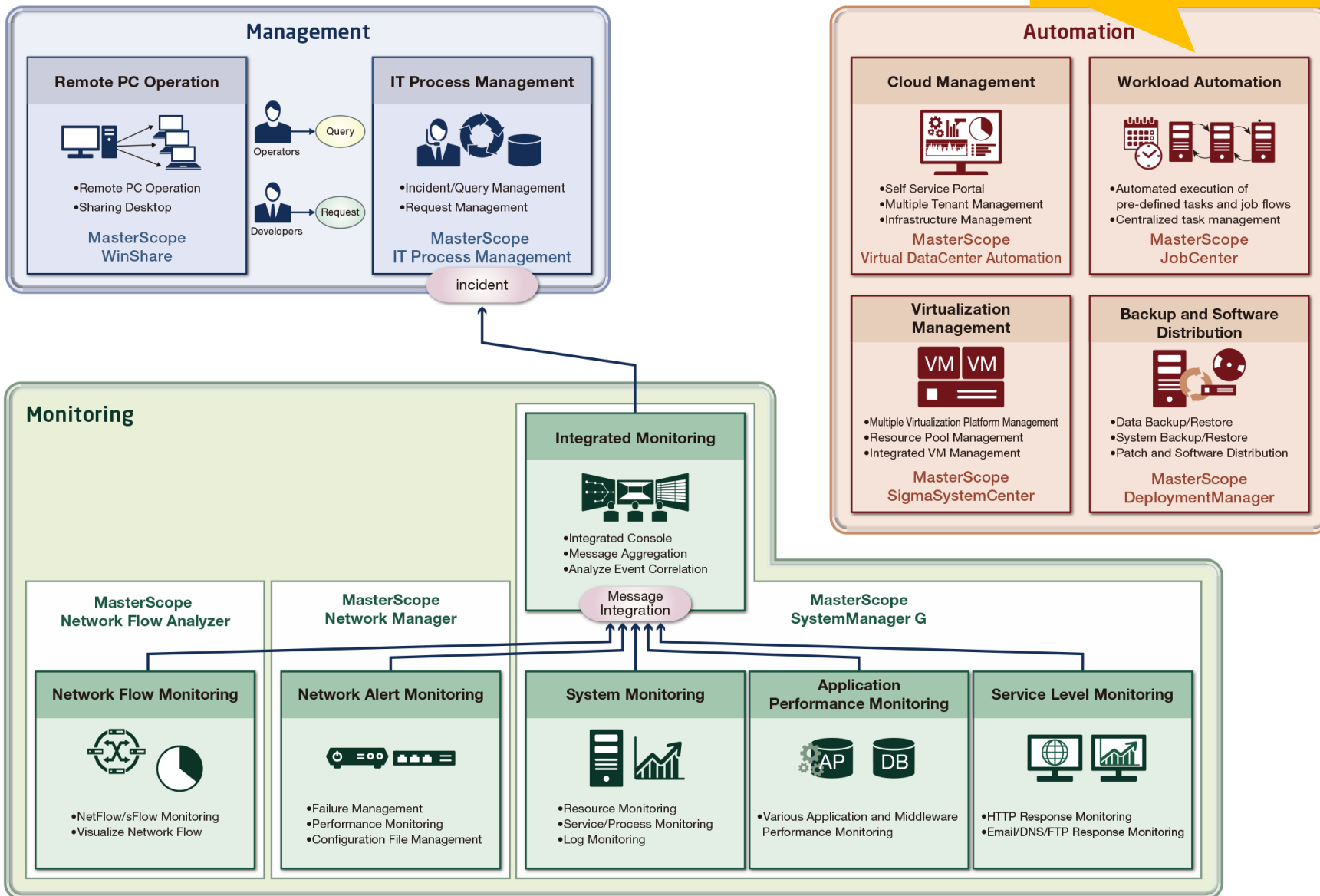
Oct, 2017

NEC Corporation



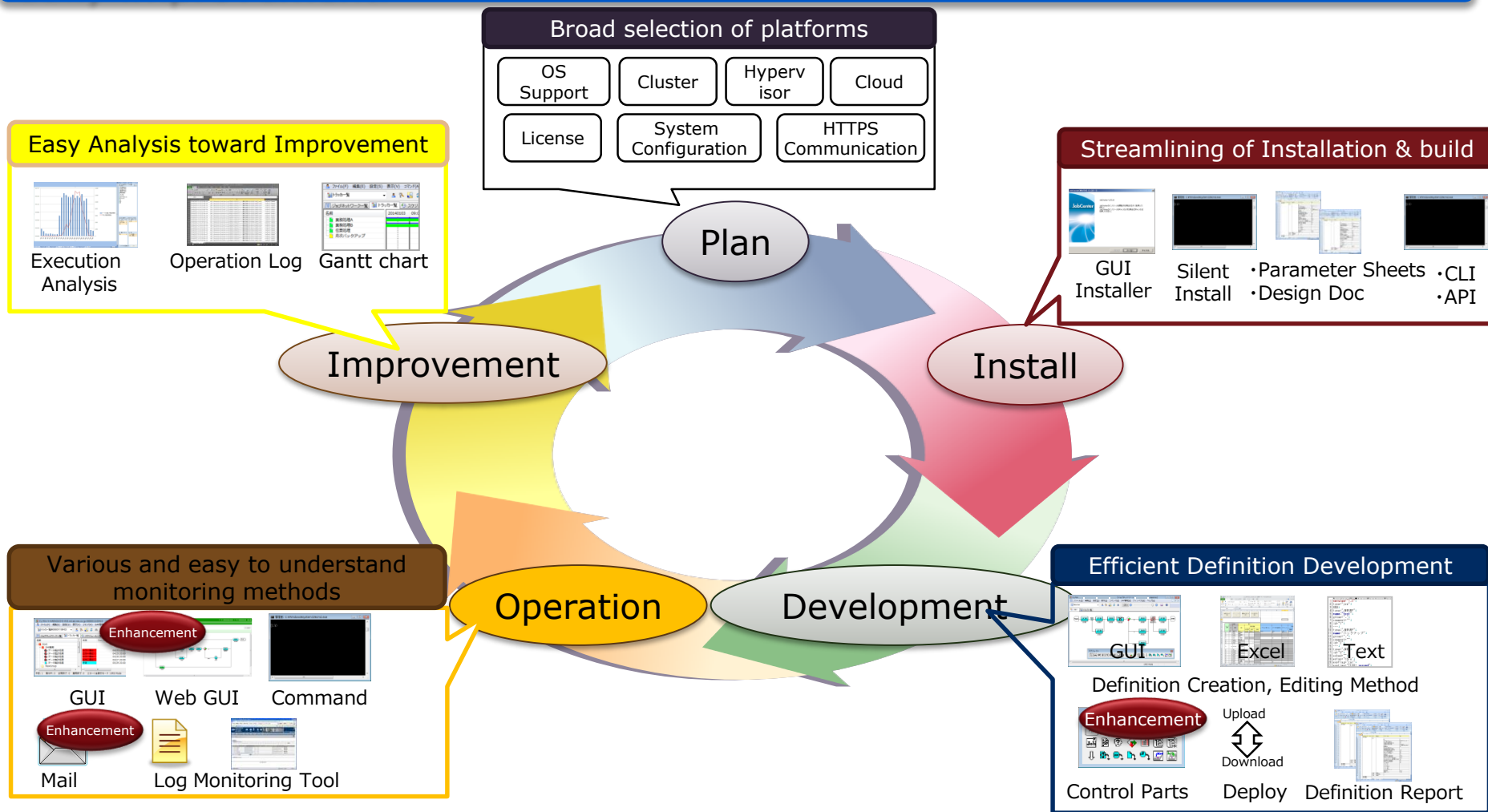
# MasterScope JobCenter in Solution Map

MasterScope JobCenter automates stylized process in system operation, and supports accurate and efficient operation of systems.



# JobCenter – Product Enhancement Policy

We enhanced functions to efficiently and totally support plan / installation which relates job management, definition development, operation and daily improvement.

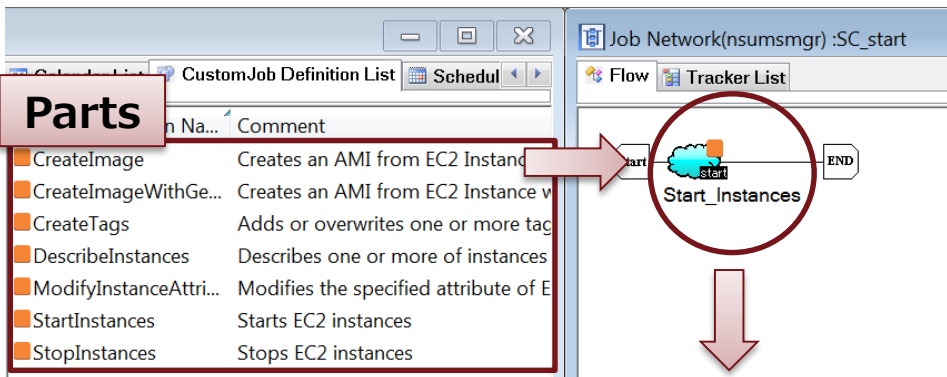


# JobCenter – Providing AWS Control Parts

JobCenter provides parts for processes which are often used for business automation such as Start / Stop of Instance or Creation of Snapshot.

**Parts**

Part Name	Comment
CreateImage	Creates an AMI from EC2 Instance
CreateImageWithGe...	Creates an AMI from EC2 Instance v
CreateTags	Adds or overwrites one or more tag
DescribeInstances	Describes one or more of instances
ModifyInstanceAttri...	Modifies the specified attribute of E
StartInstances	Starts EC2 instances
StopInstances	Stops EC2 instances



## Advantage 1

Control AWS by only putting parts on and filling parameters.

## Advantage 2

No programming. Reduce the cost for developing scripts.

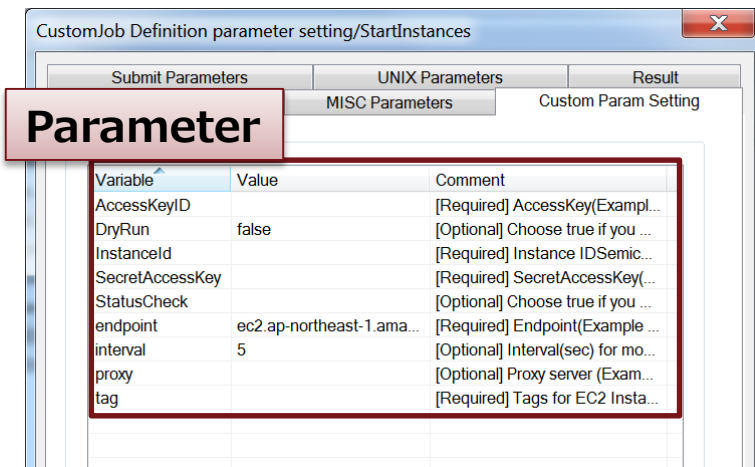
## Advantage 3

Able to build and execute complex workflow by using JobCenter parts.

**Parameter**

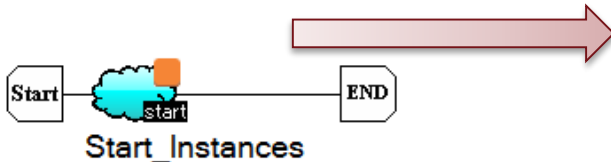
CustomJob Definition parameter setting/StartInstances

Variable	Value	Comment
AccessKeyID		[Required] AccessKey(Exempl...
DryRun	false	[Optional] Choose true if you ...
InstanceId		[Required] Instance ID Semic...
SecretAccessKey		[Required] SecretAccessKey(...
StatusCheck		[Optional] Choose true if you ...
endpoint	ec2.ap-northeast-1.ama...	[Required] Endpoint(Example ...
interval	5	[Optional] Interval(sec) for mo...
proxy		[Optional] Proxy server (Exam...
tag		[Required] Tags for EC2 Insta...



# JobCenter – Setting Image of AWS Control Parts

## 1. Put parts on job flow



## 2. Set up the necessary parameters

CustomJob Definition parameter setting/StartInstance

Variable	Value	Comment
AccessKeyID		[Required] AccessKey(Exempl...
DryRun	false	[Optional] Choose true if you ...
InstanceID		[Required] Instance IDSemic...
SecretAccessKey		[Required] SecretAccessKey(...
StatusCheck		[Optional] Choose true if you ...
endpoint	ec2.ap-northeast-1.ama...	[Required] Endpoint(Example ...
interval	5	[Optional] Interval(sec) for mo...
proxy		[Optional] Proxy server (Exam...
tag		[Required] Tags for EC2 Insta...

Comment

[Required] Instance ID  
Semicolon is the separator for multiple instance  
(Example1: i-123456ab Example2: i-123456ab;i-45678cd)  
\*tag or Instanceid is needed

Icon Setting  
Icon Type Cloud-EC2-start

Version Information  
Date modified 2016/11/25 11:31:14

Buttons: New, Edit, Delete, OK, Cancel, Apply, Help

In the case of starting a instance, only set up the instance id (Example: i-98765741)

Enable to start instance by tag (Example: AutoOn=yes)

**Point**

JobCenter can also use "IAM Role" for controlling AWS, so we do not need to register AccessKeyID and SecretAccessKey.

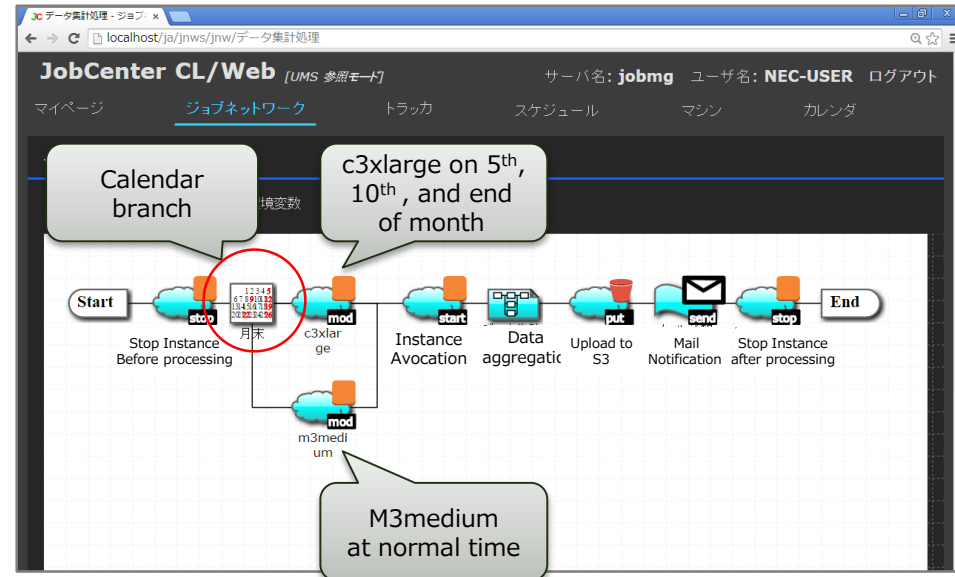
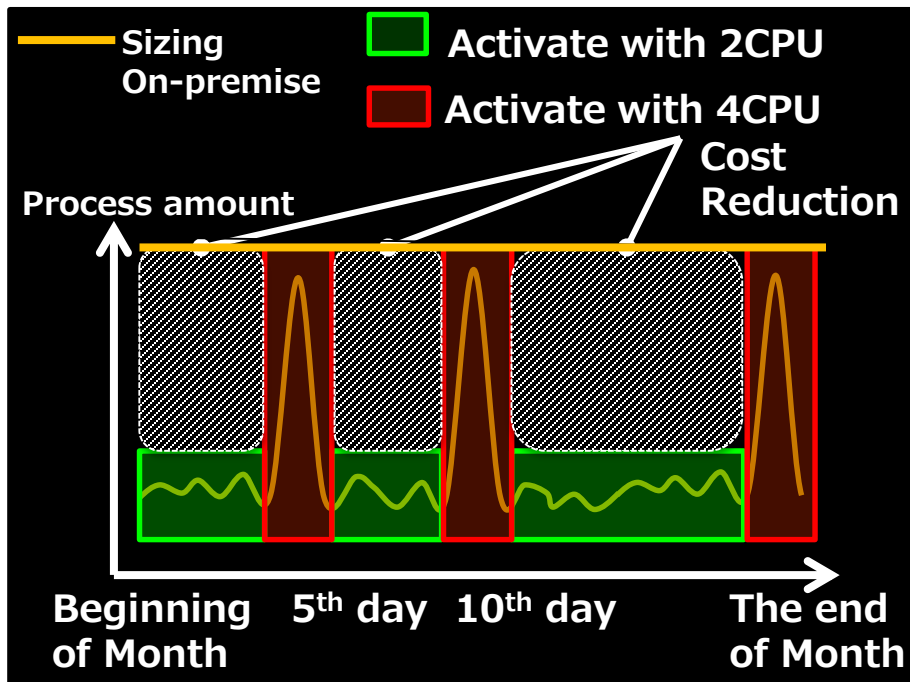
# JobCenter – Example) Flow Control by Using AWS Control Parts

JobCenter automates businesses at most suitable cost by defining Activate Spec based on amount daily process and executing business processes.

You can optimize cost by activating servers with specified spec to suit daily process amount.

JobCenter easily automates your businesses by utilizing merits of Cloud !

- On-premise -> Need sizing at maximum process amount
- Cloud -> Able to activate at optimal spec suits for process amount
- Calendar branch Parts : Branch process based on date
- AWS Control Parts : Start/Stop/Spec change of Instance



# The list of controlling parts for AWS

Service	Controlling	Description
Amazon EC2	Start Instances	Start target instances
	Stop Instances	Stop target instances
	Modify Instance Attribute	Modify attribute of target instance
	Describe Instances	Describe the more detailed information of target instances
	Create AMI	Create AMI for the instance
	Create Tags	Create tags for each ec2 resources
Amazon EBS	Create Snapshot	Create snapshot for target volumes (using instance-id, instance-tag, volume-id, volume-tag). Manage backup generation.
	Delete Snapshot	Delete a target snapshot.
	Describe Snapshots	Describe the more detailed information of target snapshots
	Copy Snapshot	Copy a snapshot(to the same region or to another region)
Amazon S3	Put Object	Upload target files to S3
	Get Object	Download target files to S3
	Delete Object	Delete target files on S3
Amazon ELB	Attach ELB	Attach a instance to ELB
	Detach ELB	Detach a instance to ELB
Amazon CloudFormation	Create Stack	Create a stack from template
	Delete Stack	Delete a target stack
	Describe Stacks	Describe the more detailed information of target stacks

It is free to use the AWS control parts, no additional license.  
We plan to develop more job components for control AWS gradually.

# [EC2] How to stop instances

## JobCenter can start and stop instances by specifying instance-id or tags

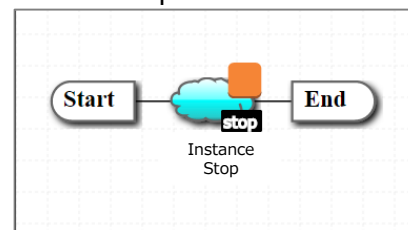
### ■ Designation Method of Instance Start/Stop

pattern	Designation Method	Overview
(1)	EC2's Instance ID	Specify Instance ID, and Start/Stop Instance whose ID is matched. (Able to control only specific Instances)
(2)	EC2's tag	Specify EC2's tag, Start/Stop all EC2's Instance which is attached by the tag. (Changing flow isn't required even if Instances would be increased.)

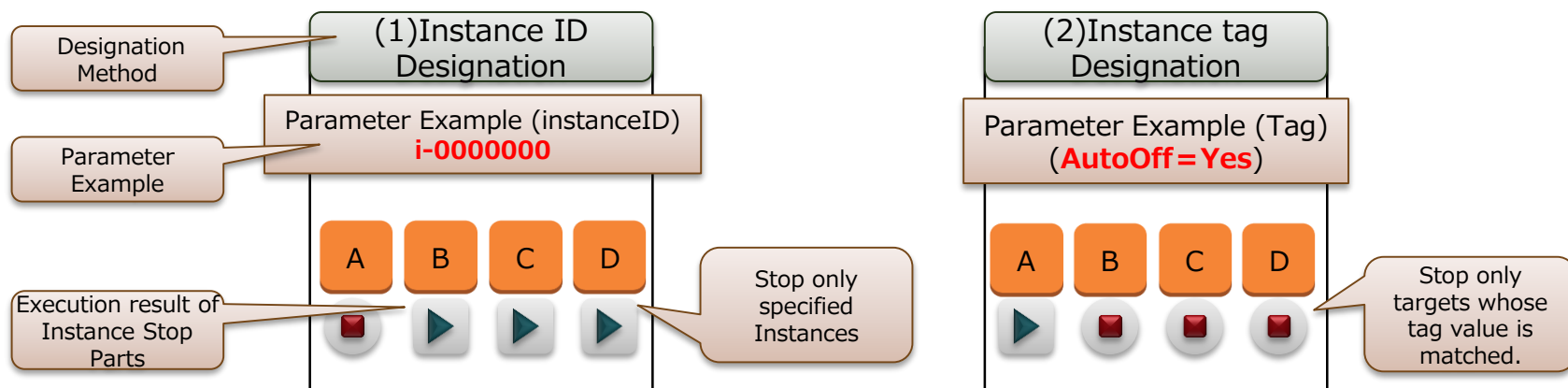
### ■ Instance list Example

Instance Name	Instance ID	tag(AutoOff)	Status
A	i-0000000	No	Running
B	i-1111111	Yes	Running
C	i-2222222	Yes	Running
D	i-3333333	Yes	Running

### Flow sample



### ■ Images of stopping Instances by different parameter designation methods.



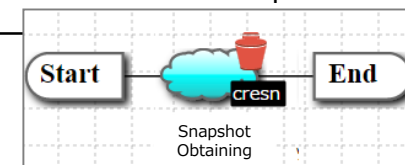


# [EBS] How to take snapshots

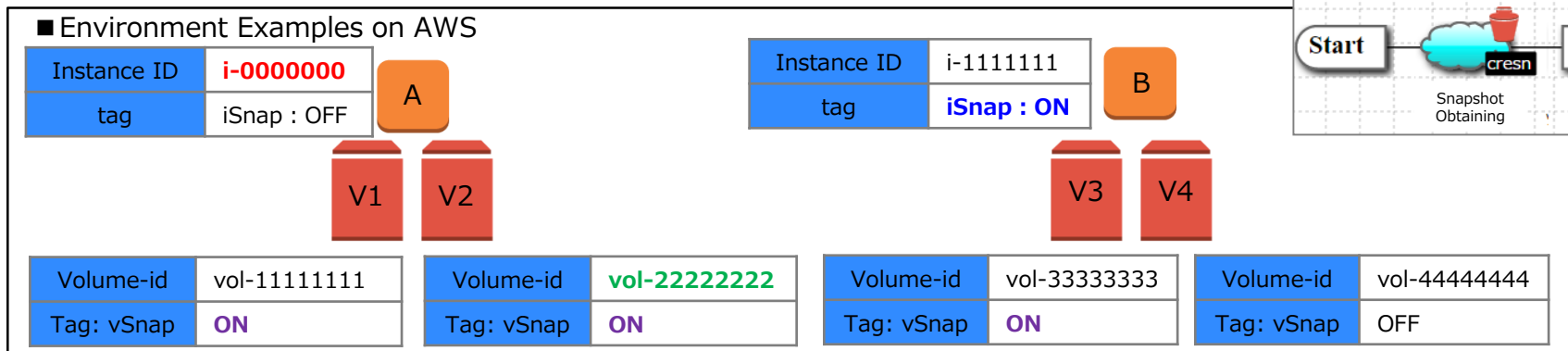
## ■ Patterns of Snapshot Obtaining Method

Pattern	Designation Method	Overview
(1)	EC2's Instance ID	Specify Instance ID, and create all EBS's Snapshot connected to the ID.
(2)	EC2's tag	Specify EC2's tag, and create all EBS's Snapshot attached with the tag.
(3)	EBS's Volume ID	Specify EBS's Volume ID, and create the EBS Volume's Snapshot.
(4)	EBS tag	Specify EBS's tag, and create all EBS's Snapshot attached with the tag.

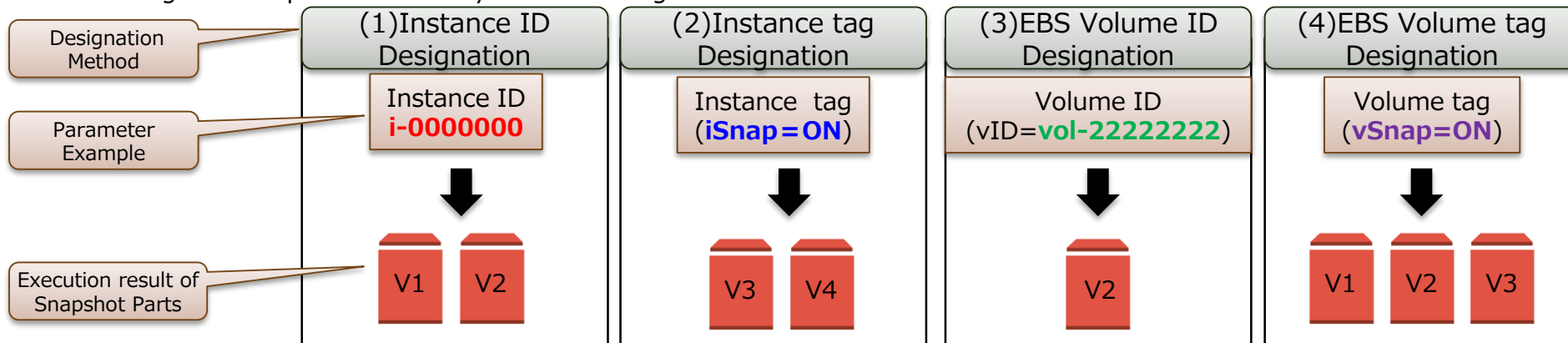
Flow sample



## ■ Environment Examples on AWS



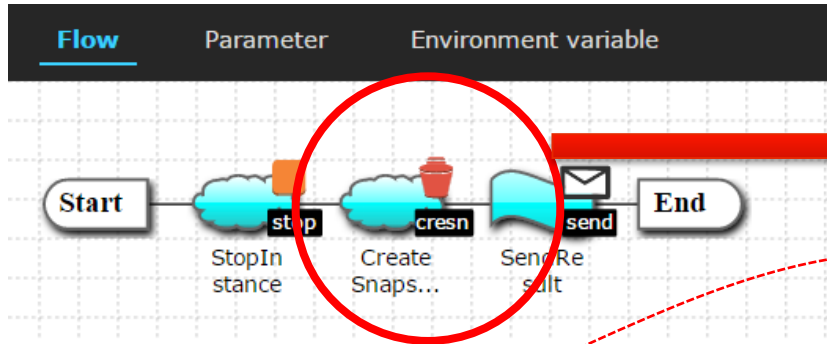
## ■ Images of Snapshot created by different designation methods



# Advantage of controlling parts for AWS(1)

Not submitting API, JobCenter provides series of Processes to use AWS easily.

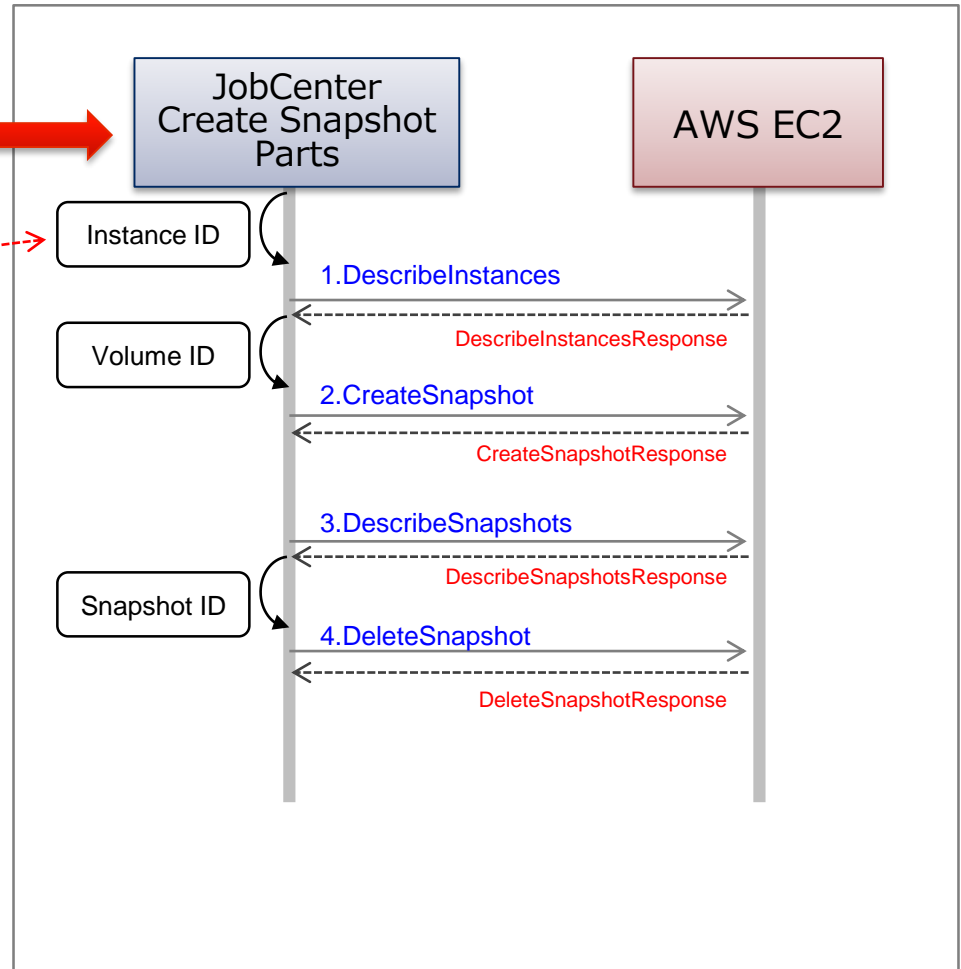
## Example: Create Snapshots



## Parameter list: Create Snapshots

Key	Value
AccessKeyID	IAMRole
Description	Created by WebSAMJobCenter
DryRun	false
InstanceID	i-123456ab
Instancetag	
SecretAccessKey	IAMRole
Volumeld	
Volumetag	
endpoint	ec2.ap-northeast-1.amazonaws.com
generation	2
proxy	

## Create Snapshot Procedure



# Advantage of controlling parts for AWS(2)

Execution results of API are stored and it's customizable and reusable to Email Notification

Example: Sending the result of Create Snapshot by Email



## - API Result

- DescribeInstancesResponse
- CreateSnapshotResponse
- DescribeSnapshotsResponse
- DeleteSnapshotResponse



## Customizing the template of API Result

```
CustomJob Definition Script Setting/CreateSnapshot
===== target volumes ====={{#DescribeInstancesResponse.reservationSet}}(item){{#instan
***** VolumeId: {{#volumeId}}(volumeId) *****
status: {{#status}}(status)
deleteOnTermination: {{#deleteOnTermination}}(deleteOnTermination)
attachTime: {{#attachTime}}(attachTime)
deviceName: {{#deviceName}}(deviceName)
instanceId: {{#instanceId}}(instanceId)
{{#item}}(instancesSet){{#item}}(DescribeInstancesResponse.reservationSet){{#DescribeVolumesRespo
***** VolumeId: {{#volumeId}}(volumeId) *****{{#attachmentSet}}(item)
status: {{#status}}(status)
deleteOnTermination: {{#deleteOnTermination}}(deleteOnTermination)
attachTime: {{#attachTime}}(attachTime)
instanceId: {{#instanceId}}(instanceId)
{{#item}}(attachmentSet){{#item}}(DescribeVolumesResponse.volumeSet)
===== snapshot status check ====={{#DescribeSnapshotsResponse.snapshotSet}}(item)
***** VolumeId: {{#volumeId}}(volumeId) *****
snapshotId: {{#snapshotId}}(snapshotId)
status: {{#status}}(status)
ownerId: {{#ownerId}}(ownerId)
encrypted: {{#encrypted}}(encrypted)
volumeSize: {{#volumeSize}}(volumeSize)
startTime: {{#startTime}}(startTime)
{{#item}}(DescribeSnapshotsResponse.snapshotSet)
===== snapshot result ====={{#JobCenterResult}}
***** VolumeId: {{#VolumeId}} *****{{#Response}}
----- snapshot result -----{{#CreateSnapshotResponse}}
```

## Email body

```
Snapshot Result
===== target volumes =====
***** VolumeId: vol-82492239 *****
status: attached
deleteOnTermination: true
attachTime: 2016-11-15T08:34:01.000Z
deviceName: /dev/sda1
instanceId: i-e30fc36d

===== snapshot status check =====
***** VolumeId: vol-82492239 *****
snapshotId: snap-dabca954
status: completed
ownerId: 628364910513
encrypted: false
volumeSize: 40
startTime: 2016-11-25T03:53:11.000Z

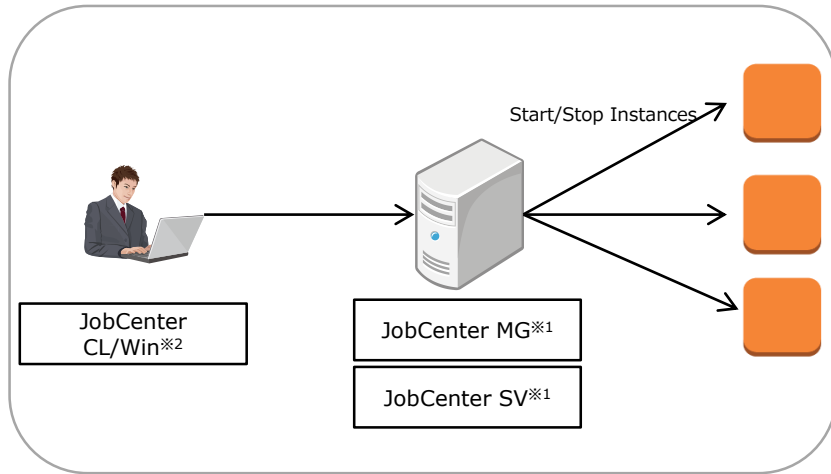
===== snapshot result =====
***** VolumeId: vol-82492239 *****
----- snapshot result -----
snapshotId: snap-dabca954

----- rotation result -----
***** snapshotId: snap-dabca954 *****
volumeId: vol-82492239
progress: 100%
ownerId: 628364910513
encrypted: false
description: backup
status: completed
volumeSize: 40
startTime: 2016-11-25T03:53:11.000Z

===== summary =====
TargetVolumeId=vol-82492239
```

# Composition example to control AWS 1/2

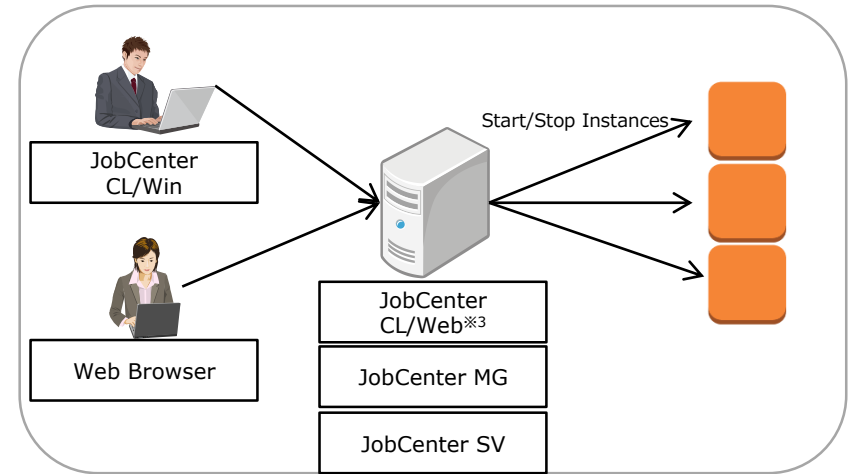
## Minimum License Requirements



Product Name	Qty
WebSAM JobCenter MG	1
WebSAM JobCenter SV	1
WebSAM JobCenter Media	1

Minimum license requirements for controlling AWS by JobCenter  
 ※1 Enable to control AWS by JobCenter MG/SV located on on-premises or AWS environment(https connection is required)  
 ※2 JobCenter CL/Win(5 license) is included into JobCenter MG

## Dashboard Option Requirements



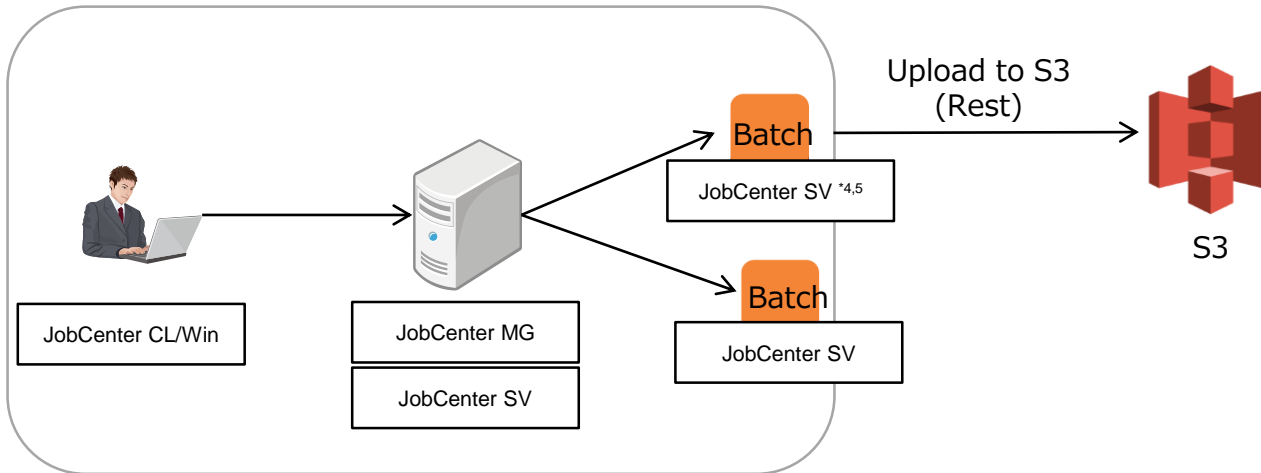
Product Name	Qty
WebSAM JobCenter MG	1
WebSAM JobCenter SV	1
WebSAM JobCenter Media	1
WebSAM JobCenter CL/Web	1

JobCenter CL/Web license is needed if you use JobCenter web dashboard.

※3 JobCenter CL/Web can be installed separately from JobCenter MG  
 No dependent on the number of connection

# Composition example to control AWS 2/2

Use a Business batch on a target Instance



Product Name	Qty
MasterScope JobCenter MG	1
MasterScope JobCenter SV	3
MasterScope JobCenter Media	1

This is an example to process a business batch on AWS's Instance.

\*4 It is required that JobCenter MG and JobCenter SV can communicate each other.

\*5 When Upload/Download Files to S3, it is required to execute S3 job on the server in which the File exists.

# Option: Check JobCenter on Web Dashboard

JobCenter has web GUI. User can arrange dashboard layout or reference range to fit their operation.

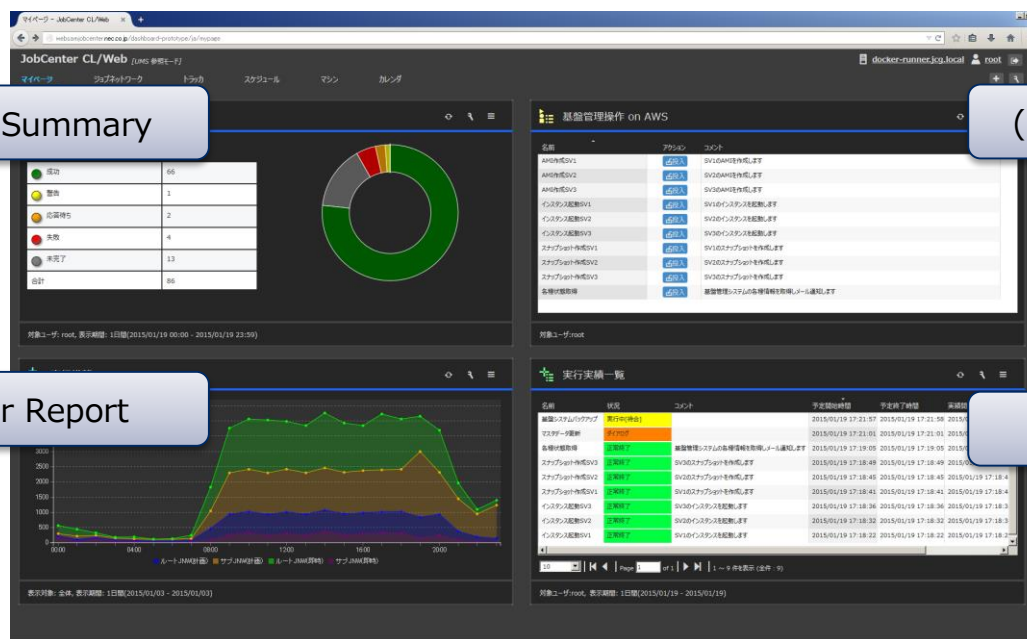
Function	Panel Name	Overview
Report Function	(1)Tracker Summary	You can summarize execution records of Tracker and confirm it.
	(2)Tracker Report	You can confirm transition of execution records (Tracker) by the graph.
My list Function	(3)My Job Network list	You can register Job Flows you often use, and execute from Browser instantly.
	(4)My Tracker list	You can select execution records (called "Tracker"), and confirm it in the list.

(1) Tracker Summary

(3) My Job Network list

(2) Tracker Report

(4) My Tracker list



# Option: Edit Own Web Dashboard

1. Select a panel and input a name

パネルの追加

マイリスト

- JNWマイリスト
- トラッカマイリスト

レポート

JNWマイリスト

パネル名を設定してください。

パネル名

パネルの大きさ

middle

パネルの順番

1番目

保存

ジョブネットワークのマイリストを作成します。

2. Select Job Network to display

設定 - 実行状況サマリ

JNWマイリストの設定

- 列の表示
- パネルの大きさと順番
- パネル名の変更
- パネルの削除

JNWマイリスト

ユーザ名

nsumsmgr

ジョブネットワーク一覧

- TestDrive
  - 任意演習
  - 演習
    - EC2インスタンススベック変更
    - EC2インスタンス停止
    - EC2インスタンス起動
    - スナップショット取得
    - 指定日スベック変更
- UnitJnw

選択済みリスト

- EC2インスタンススベック変更
- EC2インスタンス停止
- EC2インスタンス起動
- スナップショット取得
- 指定日スベック変更

保存

JNWマイリストで表示するジョブネットワークを選択します。

3. My Job Network list is completed

メンテナンスジョブフロー

名前	状況	アクション
EC2インスタンススベック変更	-	投入
EC2インスタンス停止	-	投入
EC2インスタンス起動	-	投入
スナップショット取得	-	投入
指定日スベック変更	-	投入

対象ユーザ:nsumsmgr

# Option: Edit and Limit Functions for Users

When you don't want to open AWS's management console to Operator, but you want to provide necessary functions required for operations, you can provide simplified control Panel by using Dashboard function.

## Example: Controlling AWS Dashboard

The screenshot shows a web browser window with the URL 'jobmg/dashboard-prototype/ja/mypage'. The page title is 'JobCenter CL/Web' and it includes navigation tabs like 'マイページ', 'ジョブネットワーク', 'トラッカ', 'スケジュール', 'マシン', and 'カレンダー'. The main content area is divided into three sections, each with a title and a table of actions:

- インスタンス起動 (Instance Start):** Contains four rows of actions for instances A, B, C, and D. Each row has a '移入' (Import) button.
- インスタンス停止 (Instance Stop):** Contains four rows of actions for instances A, B, C, and D. Each row has a '移入' (Import) button.
- スナップショット作成 (Snapshot Creation):** Contains four rows of actions for instances A, B, C, and D. Each row has a '移入' (Import) button.

You can display limited executable Job Flows

You can add Panels freely. So, you can display Information categorized by units for easy operation.

Flow list of AWS Instance Start

Flow list of AWS Instance Stop

Flow list of Snapshot Creation



# AWS Case study - Reliable Power Bulk Control

Start instances and check their status for reliable control.  
Control by tags and find instances without tags.

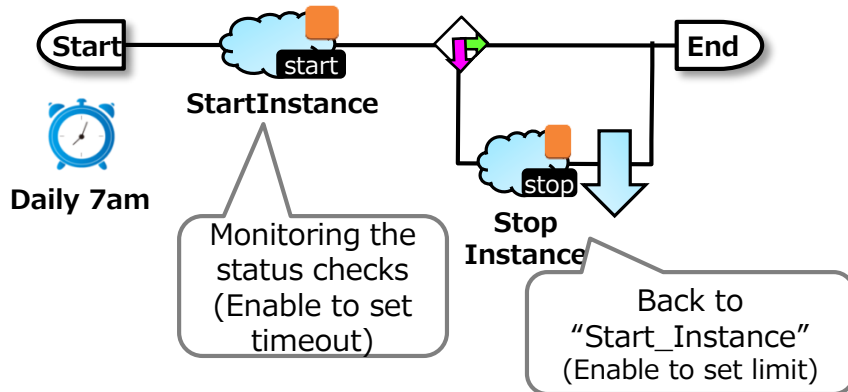
## Tips

When the instance state is "running", we do not know whether it is possible to connect to or not.  
If network and OS is OK, the status checks is "2/2 checks passed"

## Therefore

### JobCenter can monitor the status checks

JobCenter is waiting until the status checks turn to "2/2 checks passed" for reliable controlling



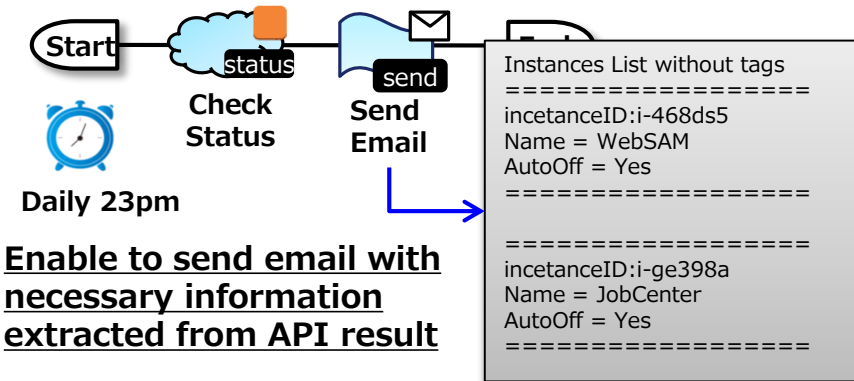
## Tips

JobCenter can do bulk power control by tags.  
However, it is difficult to manage all instances and their tags.  
Someone might forget to put necessary tags to some instance.

## Therefore

### JobCenter can find the instances without tags

JobCenter can send email to notify the instances without necessary tags.



# AWS Case study - Easy and Automatic Backup

Create snapshot/AMI and manage generation.  
Create workflow for backup procedure and schedule it.

## Tips

In the case of script using AWS API, several preparations such as checking instance status, getting volume-id, and etc. are needed. In addition, the script will be more complicated according to increase of instances.

## Therefore

### JobCenter can backup easily

JobCenter create snapshot parts is implemented all procedure for backup operation.

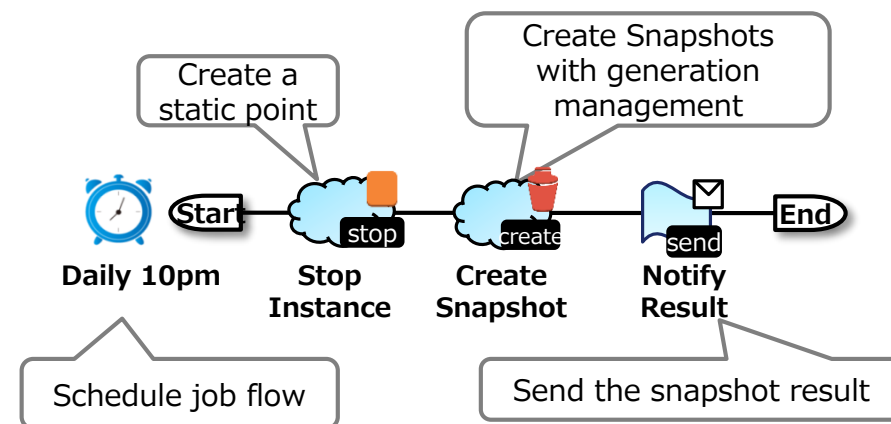
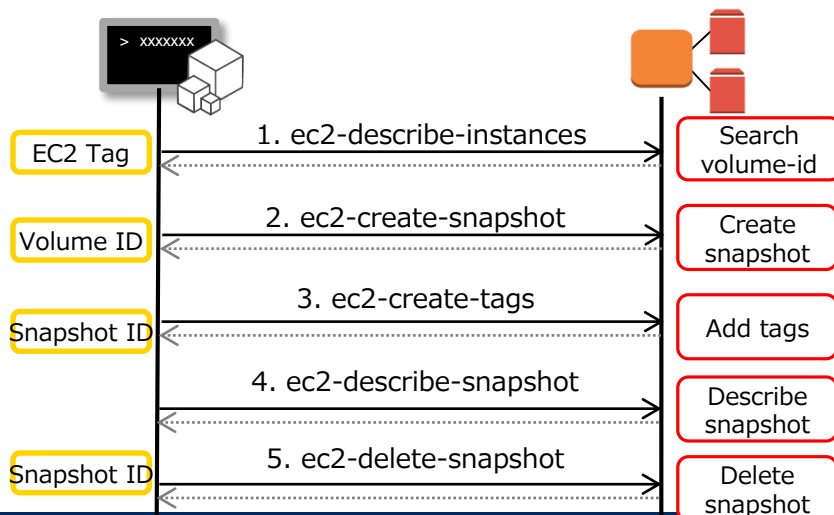
## Tips

We need to create a static point to backup the instance. To complete backup procedure, we need to do several steps such as stopping instance, creating snapshot and starting instance without mistakes.

## Therefore

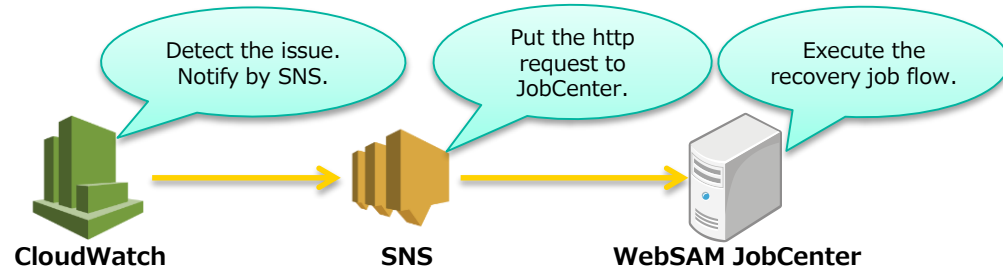
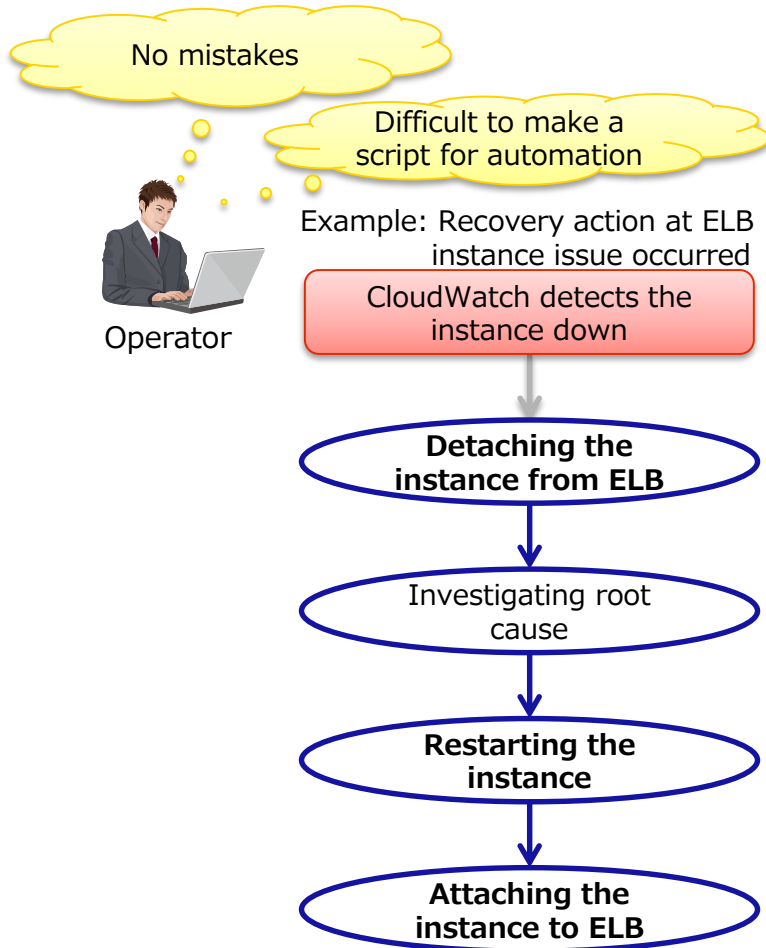
### JobCenter can operate steps by workflow

JobCenter executes and monitors completion of each steps automatically.



# AWS Case study - linkage with AWS CloudWatch

Automate the recovery action after AWS CloudWatch detects the issues



**Tips**  
JobCenter can support receiving the request from SNS to submit the job flow

**Therefore**  
JobCenter can automate the action to recover the instance.  
If you create a topic in AWS SNS configuration and set endpoint with JobCenter URL, the recovery action will execute it automatically.



# AWS Case study

## - Archive High Availability of JobCenter on AWS

The linkage of JobCenter and ExpressCluster to archive high availability on AWS

### Background

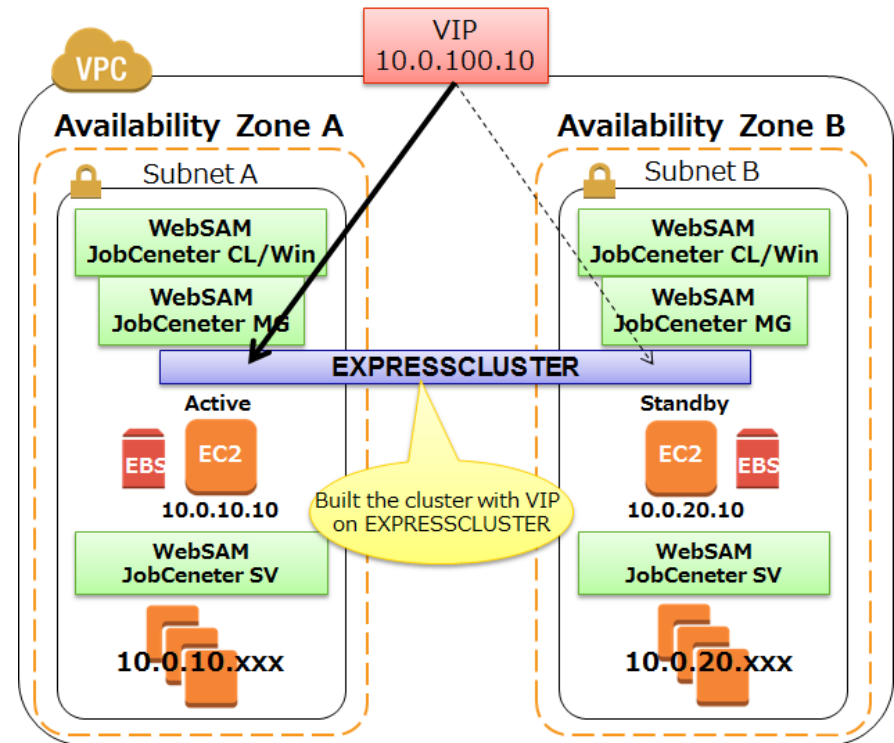
- **Necessity of batch job scheduler to automate enterprise system on AWS**
- Necessity of keeping high availability as same as on-premises system

### Reason

- **JobCenter is already used in existing system and has proven capability of automation of complex job flow**
- **ExpressCluster has several installation cases and provides documentation for AWS environment**

### Benefit

- ExpressCluster supports failover across different availability zone and archive high availability.
- Failover with small network delay and no performance degradation.(Failover time is a few minutes)



**WebSAM JobCenter Setup Guide (AWS)**

<http://jpn.nec.com/websam/jobcenter/download.html#iaas>

**CLUSTERPRO Setup Guide (AWS)**

[http://jpn.nec.com/clusterpro/clp/cloud/cloud\\_sysrep.html#aws](http://jpn.nec.com/clusterpro/clp/cloud/cloud_sysrep.html#aws)

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