IT Automation

Offline Installation

※ In this document, “Exastro IT Automation” is described as “ITA".

Exastro IT Automation Version 1.11

Exastro developer

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1. Introduction

1.1 About This Guide

About this guide

- This guide describes the procedure to construct ITA server in offline environment.

2. System configuration

2.1 Associated execution function 1/2

About associated execution function

- IT Automation supports the tools for the following functions:

Driver	Tool name (orchestrator)	Function name	Description	Installable with the IT Automation configuration tool	To be installed through this guide
Create_param	-	Create menu	This function allows you to create menus.	-	○
Hostgroup	-	Host grouping	This function allows you to group hosts into logical units (functions and roles) and to manage the parameters to be applied.	-	○
Ansible driver	Ansible	System construction	A Red Hat-provided OSS tool for setting up a platform. For a networked device, this tool allows you to install software, configure various settings, transfer files, and apply patches, based on an IaC called Playbook.	○	○
	Ansible Tower	System construction	A management platform to enhance Ansible with such functions as access control, job scheduling, and task visualization.	×	
Cobbler driver	Cobbler	OS installation	An OSS tool for automating installation. For a networked device, this tool allows you to install an OS, based on a prepared template.	×	×
Terraform driver	Terraform	System construction	Terraform is an orchestration tool provided by HashiCorp, Inc. that improves the efficiency of infrastructure process. The construction is executed after the execution plan is generated based on the infrastructure configuration coded in HCL (HashiCorp Configuration Language) . Furthermore, with Policy as Code, it's also possible manage access policy in code.	×	○
Terraform CLI driver	Terraform CLI	System construction	Terraform is an orchestration tool provided by HashiCorp, Inc. that improves the efficiency of infrastructure process. The construction is executed after the execution plan is generated based on the infrastructure configuration coded in HCL (HashiCorp Configuration Language) .	×	○

2.1 Associated execution function 2/2

Driver	Tool name (orchestrator)	Function name	Description	Installable with the IT Automation configuration tool	To be installed through this guide
CI/CD for IaC	git	CI/CD for IaC	・Creates a clone of the Git repository in ITA. ・Uses the clone to detect any updates to the Git repository files. ・Configures the link between the Git repository files and the files managed by the link software (Ansible-Driver or Terraform-Driver) .	○	×

2.2 System requirements 1/4

ITA System requirements

- Please refer to ”Exastro-ITA_System configuration/environment construction guide_basics” for details regarding ITA’s System requirements.

2.3 System requirements 2/4

Prerequisites for executing the library collection script

- To execute the library collection script, it is necessary to match the build status (OS version, installed packages) of library collection server (online environment) /ITA server (offline environment) .
- The library collection server (online environment) must be able to reference the following repositories.

  (※ See next page)

2.4 System requirements 3/4

- Repositories that needs to be referred

OS	Repository
RHEL7	https://dl.fedoraproject.org/pub/epel/epel-release-latest-7.noarch.rpm
	https://downloads.mariadb.com/MariaDB/mariadb_repo_setup
	http://rpms.remirepo.net/enterprise/remi-release-7.rpm
	rhel-7-server-optional-rpms
	https://rpm.releases.hashicorp.com/RHEL/hashicorp.repo
RHEL8	https://dl.fedoraproject.org/pub/epel/epel-release-latest-8.noarch.rpm
	codeready-builder-for-rhel-8-xxxxxx-rpms
	https://rpm.releases.hashicorp.com/RHEL/hashicorp.repo
CentOS7	epel-release
	https://downloads.mariadb.com/MariaDB/mariadb_repo_setup
	http://rpms.remirepo.net/enterprise/remi-release-7.rpm
	https://rpm.releases.hashicorp.com/RHEL/hashicorp.repo
CentOS8 CentOS Strem8	epel-release
	PowerTools
	https://rpm.releases.hashicorp.com/RHEL/hashicorp.repo

xxxxxx : Architecture

2.5 System requirements 4/4

- Repositories that needs to be referred (for cloud environments)

OS	Repository
RHEL7	https://dl.fedoraproject.org/pub/epel/epel-release-latest-7.noarch.rpm
	https://downloads.mariadb.com/MariaDB/mariadb_repo_setup
	http://rpms.remirepo.net/enterprise/remi-release-7.rpm
	rhui-rhel-7-server-rhui-optional-rpms
	https://rpm.releases.hashicorp.com/RHEL/hashicorp.repo
RHEL7 (AWS/RHUI2)	https://dl.fedoraproject.org/pub/epel/epel-release-latest-7.noarch.rpm
	https://downloads.mariadb.com/MariaDB/mariadb_repo_setup
	http://rpms.remirepo.net/enterprise/remi-release-7.rpm
	rhui-REGION-rhel-server-optional
	https://rpm.releases.hashicorp.com/RHEL/hashicorp.repo
RHEL7 (AWS/RHUI3)	https://dl.fedoraproject.org/pub/epel/epel-release-latest-7.noarch.rpm
	https://downloads.mariadb.com/MariaDB/mariadb_repo_setup
	http://rpms.remirepo.net/enterprise/remi-release-7.rpm
	rhel-7-server-rhui-optional-rpms
	https://rpm.releases.hashicorp.com/RHEL/hashicorp.repo
RHEL8_AWS	https://dl.fedoraproject.org/pub/epel/epel-release-latest-8.noarch.rpm
	codeready-builder-for-rhel-8-rhui-rpms
	https://rpm.releases.hashicorp.com/RHEL/hashicorp.repo

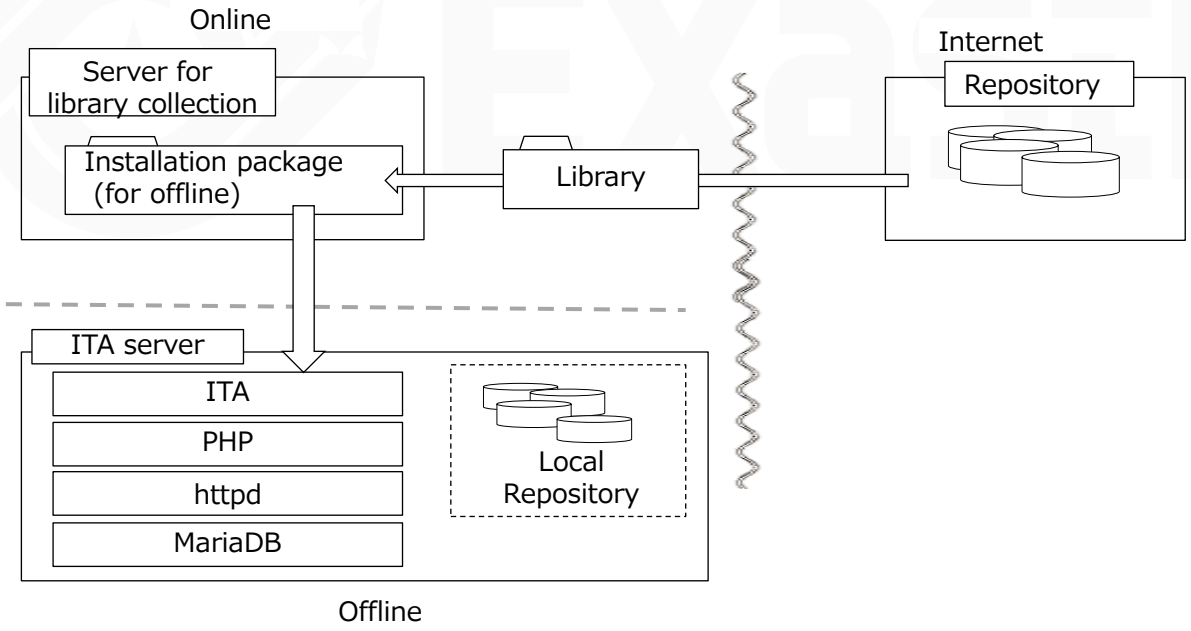
※RHEL7 (AWS/RHUI2) : RHEL7 on AWS (using RHUI2)
RHEL7 (AWS/RHUI3) : RHEL7 on AWS (using RHUI3)

3. ITA construction procedure

Installation procedure

If the ITA server is in offline environment, follow the following procedure to construct server.

- Collect required library from server for library collection (online) via internet, then compress installation package and libraries in to one installation package (for offline) .
- Move installation package (for offline) to ITA server via storage media.
- Create local repository from installation package (for offline) , install required library then execute ITA installer.



3.2 Preparation

IT Automation construction tools

- The following table lists tools for constructing IT Automation.

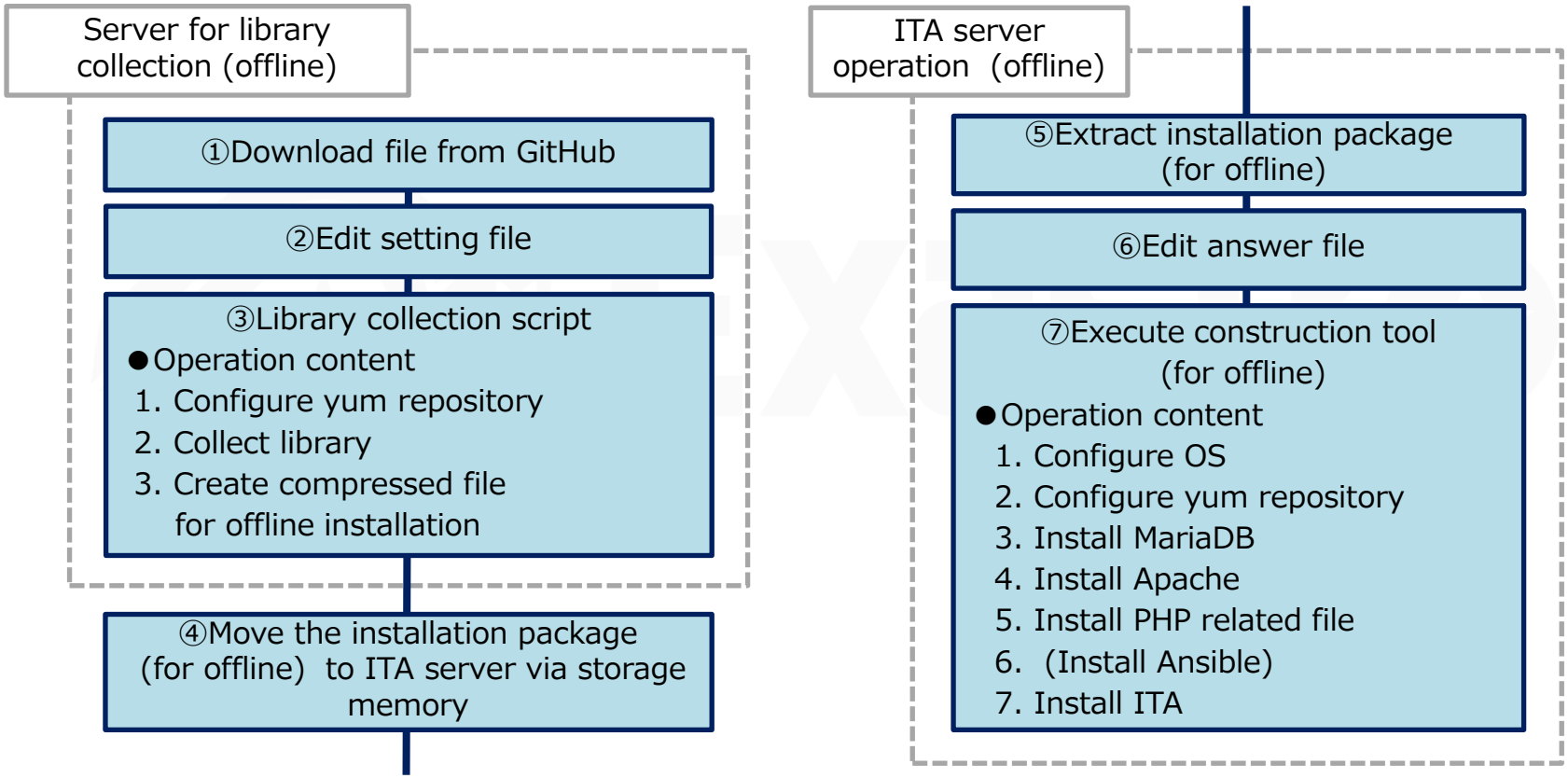
Description	File	Storage path
ITA installer	ita_installer.sh	/ (Installation file extract path) /ita_install_package/install_scripts /
Answer file	ita_answers.txt	/ (Installation file extract path) /ita_install_package/install_scripts /

RHEL Subscription

- If you want to collect libraries in an non-cloud environment RHEL7/RHEL8 OS, please make sure that you are subscribed to the environment ITA is going to be installed to in advance.

Construction flow (offline)

- The construction flow is as follows.



3.4 Construction (1/12)

※Execute in online environment
※Execute as root user

Download file from GitHub

- Download file with the following command

```
# curl -OL https://github.com/exastro-suite/it-automation/releases/download/vx.x.x/exastro-it-automation-x.x.x.tar.gz
```

※ Since v1.10.1, the command is as follows.

```
# curl -OL https://github.com/exastro-suite/it-automation/releases/download/vx.x.x_tag/exastro-it-automation-x.x.x.tar.gz
```

※Please install curl command beforehand.
※Please change the version (x.x.x) according to the file.

Extract file

- Extract .tar.gz file

```
# tar zxf exastro-it-automation-x.x.x.tar.gz
```

Change directory

- Switch current directory to the directory where the answer file and shell is located.

```
# cd it-automation-x.x.x/ita_install_package/install_scripts
```

※ Since v1.10.1, the command is as follows.

```
# cd it-automation-x.x.x_tag/ita_install_package/install_scripts
```

3.5 Construction (2/12)

Edit answer file (ita_answers.txt) .

- Create the answer file before gathering any libraries.
- If you want to collect libraries, change the "install_mode" setting value to "gather_library".
- When gathering libraries, the items "Install_mode" and "linux_os" in the answer file becomes required items.

Item	Required	Initial value	Description
install_mode	○	Install_Online	Install mode settings ・Install_Online : Install online ・Install_Offline : Install offline ・Gather_Library : Gather library ・Install_ITA : Install ITA ・Versionup_All : Update ITA (With library install) ・Versionup_ITA : Update ITA (Without library install) ・Uninstall : Uninstall ITA ※See reference for details
ita_directory	-	-	Installation directory Please specify an absolute path for the ITA Installation directory. Make sure the directory can be referenced by all users. If no installation directory exists, one will be created. ※Please make sure that other users have execution rights to ITA install directory and all its parent directories.
ita_language	-	en_US	ITA display language (Japanese (ja_JP) ／English (en_US))
linux_os	○	-	ITA Server OS("CentOS7","CentOS8","RHEL7","RHEL8") ※Specify CentOS8 if you are using CentOS Stream8. ※CentOS8.x has reached EOL and is not supported
distro_mariadb	○	yes	Select the repository MariaDB will be installed from. yes : Install from repository delivered by the Linux distribution. no : Install from the MariaDB official depository (https://mariadb.com/) ※If the linux_os is CentOS7 or RHEL7, MariaDB will be installed using the MariaDB official repository (https://mariadb.com/) regardless of the user settings.

3.6 Construction (3/12)

Execute library collection script

- Execute the following script to execute library collection script.

```
# sh ita_gather_library.sh
```

Check operation

- After executing library collection script, the operation contents will be output to ita_gather.log
- Log storage path
  / (installation file extract path) /ita_install_package/install_scripts/log/

Move file

- Move installation package (for offline) to ITA server via storage media

※The following command are executed in ITA server (Offline environment)

Extract installation package (for offline)

- Extract installation package (for offline) on ITA server

```
# tar zxf ita_Verx.x_offline_yyyymmddhhmmss.tar.gzx
```

Edit answer file (ita_answers.txt)

- Please edit the answer file to configure the ITA Update.
- If you wish to do the installation offline, change the "install_mode" setting value to "Install_Offline".

Answer file (ita_answers.txt) item list (1/2)

Item	Required	Initial value	Description
install_mode	○	Install_Online	Install mode settings ・Install_Online : Install online ・Install_Offline : Install offline ・Gather_Library : Gather library ・Install_ITA : Install ITA ・Versionup_All : Update ITA (With library install) ・Versionup_ITA : Update ITA (Without library install) ・Uninstall : Uninstall ITA ※See reference for details
ita_directory	○	/exastro	Installation directory Please specify an absolute path for the ITA Installation directory. Make sure the directory can be referenced by all users. If no installation directory exists, one will be created. ※Please make sure that other users have execution rights to ITA install directory and all its parent directories.
ita_language	○	en_US	ITA display language (Japanese (ja_JP) ／English (en_US))
Linux_os	○	-	ITA Server OS ("CentOS7","CentOS8","RHEL7","RHEL8“) ※Specify CentOS8 if you are using CentOS Stream8. ※CentOS8.x has reached EOL and is not supported
distro_mariadb	-	yes	Not needed for Install_Offline Select the repository MariaDB will be installed from. yes : Install from repository delivered by the Linux distribution. no : Install from the MariaDB official depository (https://mariadb.org/) ※If the linux_os is CentOS7 or RHEL7, MariaDB will be installed using the MariaDB official repository (https://mariadb.org/) regardless of the user settings.

3.8 Construction (5/12)

- The items from " ITA base" to " Terraform driver" are install setting items for ITA, ITA functions and any connected drivers.

  - Answer file (ita_answers.txt) item list (2/2)

Item	Required	Initial value	Description
db_root_password	○	-	Root password for MariaDB
Db_name	○	-	Database name for MariaDB
Db_username	○	-	Database username for MariaDB
Db_password	○	-	Database password for MariaDB
ita_base	○	yes	Installs ITA (“yes” only)
create_param	○	yes	Decides whether to install the menu creation function or not
hostgroup	○	yes	Decides whether to install the host group function or not
ansible_driver	○	yes	Decides whether to install Ansible driver or not
cobbler_driver	○	no	Decides whether to install Cobbler driver or not
terraform_driver	○	yes	Decides whether to install Terraform driver or not
cicd_for_iac	○	no	Decides wheter to install the CI/CD for IaC function or not
Terraformcli_driver	○	yes	Decides whether to install Terraform CLI driver or not
ita_domain	○	exastro-it-automation.local	ITA domain name specification (used when the ITA installer creates a self-certificate.
certificate_path	Optional	-	Specify the path of the file used for the user specified SSL server certificate (Enter only when using a user specified SSL certificate. Specify an absolute path)
private_key_path	Optional	-	Specify the path of the file used for user-specified SSL private keys. (Enter only when using a user-specified SSL private key. Specify an absolute path)

User specified server certificates and private keys.

- It is possible to use files prepared by users as server certificates and private keys. If you want to use them, please prepare both a server certificate and a private key and input their file paths to "Certificate_path" and "private_key_path" respectively in the answer file. It is not possible to use only either server certificates or private keys.

- If the server certificate includes an intermediate certificate,
  Create a file that connects the two and set the path of the file to "certificate_path"

  Example of Creation command
  #cat (Server certificate file) (Intermediate certificate file) (Linked server certificate file) .

- If nothing is input for "certificate_path" and "private_key_path",
  The ITA installer will use the value of "ita_domain" in the answer file to create and install the self-certificate.
  (※The "ita_domain" is used as the common name when creating the self-certificate. It is also the file name for the self-certificate and the private key.)

3.10 Construction (7/12)

- When installing, the server certificate and private key are placed in the (/etc/pki/tls/certs) . However, since they will be removed from that directory when uninstalled, please manage the original server certificate and private key files with care when using user-specified server certificates and private keys.

- When uninstalling, if both "certificate_path" and "private_key_path" in the answer file (ita_answers.txt) are specified, the specified files will be deleted. If no file is specified, the name specified in "ita_domain" will be used to delete the used file.

Sample of the answer file (ita_answers.txt)

- The following shows an example of the answer file (ita_answers.txt) :

Answer file (ita_answers.txt) sample (1/2)

```
# Select install mode.
#  ("Install_Online","Install_Offline","Gather_Library","Install_ITA",
# "Versionup_All","Versionup_ITA","Uninstall")
# e.g)  install_mode:Install_Online
# *This installer operates according to the inputted values below.
#  Install_Online: ITA will be installed after the necessary libraries
#                  has been installed via internet.
#  Install_Offline: ITA will start installing using the package created
#                   in Gather Library.
#  Gather_Library: Gathers the necessary libraries via internet and creates
#                  the package necessary to execute Install_Offline.
#                  (Execute this before executing Install_Offline)
#  Install_ITA: Installs ITA without installing any libraries.
#  Versionup_All: Installs ITA after installing the necessary libraries for
#                 the desired ITA version via internet.
#  Versionup_ITA: Updates ITA without installing any libraries.
#  Uninstall: ITA Uninstalls ITA. (Libraries will not be uninstalled)
install_mode:Install_Offline

# Enter install directory.
# e.g)  ita_directory:/exastro
ita_directory:/exastro

# Select language.  ("en_US" or "ja_JP")
# e.g)  ita_language:en_US
ita_language:ja_JP

# Select Operation System.  ("CentOS7","CentOS8","RHEL7","RHEL8")
# e.g)  linux_os:RHEL8
# * If registering a subscription is needed in order to acquire
#   the RHEL7 and RHEL8 libraries, please do so in advance.
linux_os:CentOS7

# Install MariaDB provided by distro or not.
#   yes : Install MariaDB provided by distro
#   no  : Install Official MariaDB  (https://mariadb.org/)
# Note: If "linux_os" is "CentOS7" or "RHEL7", ignore this flag and install distro's
one.
distro_mariadb:yes
```

POINT

Items in the answer file (ita_answer.txt) does not support full-width characters.

3.12 Construction (9/12)

- The following shows an example of the answer file (ita_answers.txt) :
  - Answer file (ita_answers.txt) sample (2/2)

```
# Enter the MariaDB root user's password
# e.g)  db_root_password:sample_root_password
db_root_password:sample_root_password

# Decide the database name, username, and password for ITA.
# e.g)  db_name:sample_db_name
db_name:sample_db_name
# e.g)  db_username:sample_db_username
db_username:sample_db_username
# e.g)  db_password:sample_db_password
db_password:sample_db_password

# Select the target you need to install.
# yes : need
# no  : no need
ita_base:yes
material:no
createparam:yes
hostgroup:yes
ansible_driver:yes
cobbler_driver:no
terraform_driver:no
cicd_for_iac:no
terraformcli_driver:yes

# Enter the ita domain name.
# e.g)  ita_domain:exastro-it-automation.local
ita_domain:exastro-it-automation.local

##################################################################
# Enter when using user-specified certificates and private keys.
# If no file path is entered for both "certificate_path" and "private_key_path",
# the ITA installer creates and installs a self-certificate and private key
# using the values entered in "ita_domain".

# Enter the file path where the certificate to be install.
# e.g)  certificate_path:/temp/etc_pki_tls_certs/exastro-it-automation.crt
certificate_path:

# Enter the file path where the private key to be install.
# e.g)  private_key_path:/temp/etc_pki_tls_certs/exastro-it-automation.key
private_key_path:

##################################################################
```

POINT

Define the MariaDB Database name, Username and Password in the Answer file.

***The password can only use half-with English letters/number and symbols**

POINT

Enter only if you are using both user-specified ssl certificate and private key.
It is not possible to use only one of them.

3.13 Construction (10/12)

Executing the configuration tool (for online installation)

- Execute the configuration tool with the following command:

```
# sh ita_builder_installer.sh
```

Check process

- The content of process executed by construction tool is output to ita_builder.log and ita_installer.log
- Log storage path

  / (Installation file extract path) /ita_install_package/install_scripts/log/

Exit status

- The ITA installer returns one of the exit statuses listed below depending on the shell process exit status.

  Normal exit : 0

  Abnormal exit : 1

List of libraries installed during construction.

- The following table lists the libraries installed through the configuration tool:

Installation driver	Library type	Library name
ita_base	Installation tool	yum-utils(*1), createrepo(*1)
ita_base	IT Automation common	zip, telnet, mailx, unzip, sudo, crontabs
ita_base	MariaDB	MariaDB, MariaDB-server, expect
ita_base	httpd	httpd, mod_ssl
ita_base	php(*2)	php, php-bcmath, php-cli, php-ldap, php-mbstring, php-mcrypt, php-mysqlnd, php-pear, php-pecl-zip, php-process, php-snmp, php-xml, php-json, php-gd, Python3, php-devel, libyaml, libyaml-devel, make
ita_base	php plug-in	php-yaml, HTML_AJAX-beta, PhpSpreadsheet(v1.18.0)
ansible_driver	Ansible	ansible, sshpass, pexpect, pywinrm, boto3, nmap-ncat, paramiko, boto
	git	git
cicd_for_iac	git	git
terraform_driver	Hcl analasys	python-hcl2
terraformcli_driver		

(*1) only RHEL7,CentOS7
(*2)If ITA is running on v.1.9.1 or earlier, PHP7.2 is used. If running on v1.10.0 or later, PHP7.4 is used

Time zones

Note that the PHP time zone is set to “Asia/Tokyo” by default.

As system errors might occur when the PHP and Server time zones are not unified, we recommend setting the server time zone to “Asia/Tokyo” or modifying the time zone in the php.ini file (/etc/php.ini)

Change the following line:

date.timezone = "Asia/Tokyo“

and run the following command to restart Apache.

Systemctl restart httpd

4. ITA operation check

4.1 Operation check (1/4)

Checking the main menu

- After completing the installation, take the following steps with a Windows PC client to access the main menu of IT Automation and to check that the IT Automation and all the drivers are shown properly.

Access URL

- Please access the login screen via the following URL.
- URL : **http:// (server IP address)**

※After installation, access from both HTTP and HTTPS are possible.
Since HTTP is insecure, accessing from HTTPS is recommended.
For the accessing with HTTPS, please refer to operation check (4/4) .

Login

- When the IT Automation login screen is displayed, enter the given login ID and initial password and then click the **Login** button.
  - Login ID : administrator
  - Initial password : password
- If you have logged in for the first time after the installation, you will be prompted to change the password.
- Please change the initial password.

4.2 Operation check (2/4)

ITA login screen

- If ITA is installed properly, the following login screen will be displayed.

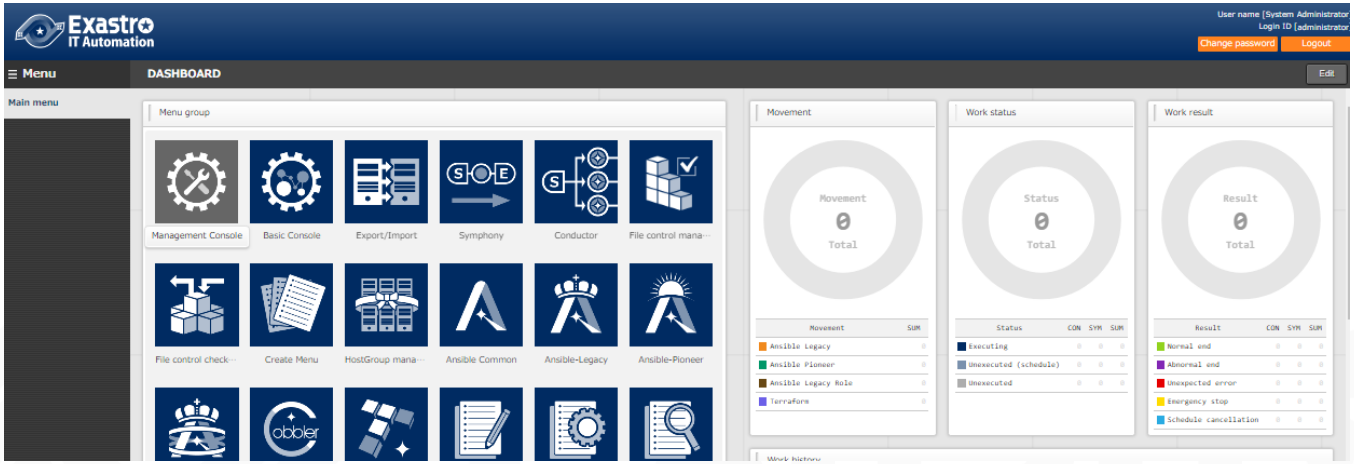
Login ID : administrator

Initial password : password

4.3 Operation check (3/4)

Checking the content by displaying the menus

- After logging in, check that the following menus are shown properly:



Function	Menu
IT Automation	Management Console
	Basic Console
	Export/Import
	Symphony
	Conductor
Create menu	Create menu
	Compare
Hostgroup	HostGroup management
Ansible driver	Ansible Common
	Ansible-Legacy
	Ansible-Pioneer
	Ansible-LegacyRole
Terraform Driver	Terraform

4.4 Operation check (4/4)

HTTPS Access preparation

- Register the host name set in the "ita_domain" field in the Answer file to the environment's DNS server or to the host of your device.

- Import certificate to the user device (Windows) .
  If you are not using user-specified server certificate, the server certificate will be stored in the following path in the ITA installation package.

Directory	File name
/etc/pki/tls/certs	[Host set to the Answer file's "ita_domain"].crt

※If you are using a user-specified server certificate, use the certificate file set in the Answer file's "certificate_path".

- Inport the certificate to the web browser.

Accessing the login screen from HTTPS

- Access the login screen with the following URL:
- URL: https:// (Host name entered in the Answer file's "ita_domain" field)
  * It is possible to access with the IP address of server instead of host name.

After connecting, follow the same procedure as from HTTP.

5. Reference

5.1 Reference (1/2)

Restrict HTTP or HTTPS access

Please perform the following procedure to restrict HTTP or HTTPS access.

- Edit “/etc/httpd/conf.d/vhosts_exastro-it-automation.conf”
  To restrict HTTP access, please comment out (#) the section from 「<VirtualHost *:80 >」 to「</VirtualHost>」
  To restrict HTTPS access, please comment out (#) the section from 「<VirtualHost *:443 >」 to「</VirtualHost>」

- Restart Apache with the following command.
  systemctl restart httpd

5.2 Reference (2/2)

Install modes

- From ITA Version 1.6.0 and onwards, the shell executed when the installer is booted is only integrated to the ita_installer. The installer behavior is branched depending on the answer file's install mode.

  - Install_Online : Installs ITA after installing the neccessary libraries online.
  - Install_Offline : Installs ITA and libraries using the package created by gather_library offline.
  - Gather_Library : Uses the internet to gather ITA Libraries and creates a package that can be used for Install_offline. (Use this before install_offline)
  - Install_ITA : Installs ITA without installing any libraries.
  - Versionup_All : Updates ITA after installing the necessary libraries online.
  - Versionup_ITA : Updates ITA without installing any libraries.
  - Uninstall : Uninstalls ITA. (Libraries will not be deleted)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