

Ansible Linux System Roles

WHAT?

This article gives an introduction to various Ansible Linux system roles that help to automate the configuration and management on SUSE Linux Enterprise Server for SAP applications 16.0 systems.

WHY?

Learn how to automate IT infrastructure with Ansible Linux system roles.

EFFORT

The average reading time of this article is approximately 40 minutes.

REQUIREMENTS

Linux fundamentals: Understanding basic Linux commands, file

• permissions, directory structures and usage of the command line.

Networking: Ansible connects to remote machines via SSH so

* knowledge of IP addresses, SSH, host names and ports is required.

YAML: Ansible playbooks are written in YAML so knowing how to

• structure a YAML file is essential.

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1 About Ansible Linux system roles

Linux system roles are a set of Ansible roles designed to automate and configure common components and services of the Linux operating system.

Linux system roles are always used with Ansible playbooks. You define the desired state of your systems in an Ansible playbook, specifying which roles to apply and with what parameters. Ansible then connects to your Linux hosts and executes the tasks defined within the roles to bring your systems into the desired state.

The system roles are shipped in the ansible-linux-system-roles package on SUSE Linux Enterprise Server for SAP applications 16.0 systems.

Once the ansible-linux-system-roles package is installed, you can access:

- Roles:/usr/share/ansible/collections/ansible_collections/suse/ linux system roles/roles
- Documentation:/usr/share/ansible/collections/ansible_collections/suse/ linux_system_roles/docs

Each role has a README in the docs directory that includes:

- Description of the role
- Supported variables and their usage
- Example playbooks

The README.md files for each role:

```
/usr/share/ansible/collections/ansible_collections/suse/linux_system_roles/docs # ls
    CHANGELOG aide.md
                                 CHANGELOG timesync.md
                                                           README suseconnect.md
    CHANGELOG certificate.md
                                 README aide.md
                                                           README systemd.md
    CHANGELOG cockpit.md
                                 README certificate.md
                                                           README timesync.md
    CHANGELOG_crypto_policies.md README_cockpit.md
                                                           aide
    CHANGELOG_firewall.md
                                 README_crypto_policies.md certificate
    CHANGELOG_ha_cluster.md
                                 README_firewall.md
                                                           firewall
    CHANGELOG_journald.md
                                 README_ha_cluster.md
                                                           ha_cluster
    CHANGELOG_keylime_server.md README_journald.md
                                                           journald
    CHANGELOG mssql.md
                                 README_keylime_server.md
                                                           keylime_server
    CHANGELOG podman.md
                                 README mssql.md
                                                           podman
    CHANGELOG_postfix.md
                                 README_podman.md
                                                           selinux
    CHANGELOG_selinux.md
                                 README_postfix.md
                                                           ssh
    CHANGELOG_ssh.md
                                 README_selinux.md
                                                           systemd
```

2 Installing Ansible Linux system roles

To install Ansible Linux system roles on a SUSE Linux Enterprise Server for SAP applications control node:

• Install the roles on a control node:

```
> sudo zypper install ansible-linux-system-roles
```

The control node is where Ansible and the Linux system roles are installed. It is not required to have Ansible or Linux system roles installed on managed nodes.

3 About the firewall Linux system role

The firewall Linux system role in Ansible is a pre-packaged and reusable set of tasks and defaults designed to configure and manage the <u>firewalld</u> service on SUSE Linux Enterprise Server for SAP applications 16.0 systems.

You can use this role to:

- Install and enable the firewalld service.
- Manage zones such as public, home or internal.
- Add or remove services such as ssh to specific zones.
- Open or close ports, for example, 8080 or TCP for particular zones.
- Configure port forwarding and masquerading (NAT).
- Handle permanent and runtime configuration.

EXAMPLE 1: RESET FIREWALL AND ENABLE SSH SERVICE

```
---
- name: Erase existing config and enable ssh service
hosts: managed_nodes
become: true
```

- previous: replaced: Resets the <u>firewalld</u> configuration by removing all existing user-defined settings. previous is a string datatype and accepts value replaced.
- <u>service</u>: <u>ssh</u>: Secure Shell (SSH) as the specific network traffic type to be managed. service is a string datatype and accepts values ssh,http,tftpetc.
- state: enabled: Permanently opens the firewall for incoming SSH traffic. state is a string datatype and accepts values enabled or disabled.

EXAMPLE 2: DISABLE TFTP SERVICE

- <u>service</u>: <u>tftp</u>: Defines the Trivial File Transfer Protocol (TFTP) as the specific network service to be managed. <u>service</u> is a <u>string</u> datatype and accepts values ssh,httptftpetc.
- state: disabled: Permanently block all incoming network traffic related to tftp.
 state is a string datatype and accepts values enabled or disabled

For more details about all the variables in the firewall Linux system role, refer to the specific README.md file on the control node:

/usr/share/ansible/collections/ansible_collections/suse/linux_system_roles/docs

4 About the AIDE Linux system role

The AIDE Linux system role in Ansible installs, configures and manages the Advanced Intrusion Detection Environment (AIDE) utility on SUSE Linux Enterprise Server for SAP applications 16.0 systems.

You can use this role to:

- Ensure the AIDE package is installed on the managed node.
- Optionally generate and deploys a custom /etc/aide.conffile.
- Create the baseline AIDE database on the managed node.
- Run checks against the live system and reports any file additions, deletions, or modifications. This is used for daily intrusion detection.
- Securely fetch the AIDE database files from the remote host back to the control node.

EXAMPLE 3: AIDE ROLE

```
---
- name: Example aide role invocation
hosts: managed_hosts
become: true
gather_facts: true

tasks:
- name: Include role aide
vars:
    aide_db_fetch_dir: files
    aide_init: true
    aide_check: false
    aide_update: false
    ansible.builtin.include_role:
    name: suse.linux_system_roles.aide
```

- <u>aide_db_fetch_dir</u>: <u>files</u>: is a <u>string</u> datatype that specifies the directory on control node, where the AIDE database files are fetched and stored from the remote managed nodes. The default is <u>files</u>, which means the role expects a directory named files to exist in the same directory as the playbook being executed.
- <u>aide_init</u>: true: is a <u>Boolean</u> datatype that controls whether a AIDE database should be initialized on a managed node. The default is <u>false</u>. When set to <u>true</u>, a AIDE database is created on the managed node, it is then fetched to the control node.
- <u>aide_check</u>: false: is a <u>Boolean</u> datatype that controls whether an integrity check should be immediately run on the managed nodes. The default is <u>false</u>. When set to <u>true</u>, the AIDE check is run, data is compared with the current state of the file system with the trusted baseline database and a report is generated.
- <u>aide_update</u>: <u>false</u>: is a <u>Boolean</u> datatype that controls the creation of a new AIDE database to replace the current trusted baseline. The default is <u>false</u>. When set to <u>true</u>, the AIDE update command is run on the managed system, which performs an integrity check, creates a new AIDE database reflecting the current system state and establishes this new file as the trusted baseline for future checks.

For more details about all the variables in the AIDE Linux system role, refer to the specific README.md file on the control node:

/usr/share/ansible/collections/ansible_collections/suse/linux_system_roles/docs

5 About the Cockpit Linux system role

The Cockpit Linux system role in Ansible automates the installation and configuration of the Cockpit Web Console, a web-based graphical interface for administering SUSE Linux Enterprise Server for SAP applications 16.0 systems.

You can use this role to:

- Ensure the necessary Cockpit packages are installed.
- Ensure cockpit.socket is enabled for socket-based activation.
- Allow the administrator to set specific options in the /etc/cockpit/cockpit.conffile, such as the login title or session timeouts cockpit_config.

```
---
- name: install Cockpit on all hosts
hosts: managed_nodes
become : true
gather_facts: true

tasks:
- name: Dynamically execute the Cockpit role
ansible.builtin.include_role:
name: suse.linux_system_roles.cockpit
```

EXAMPLE 5: INSTALL COCKPIT ON ALL HOSTS AND AUTOMATICALLY OPEN THE FIREWALL PORT

```
- name: Install Cockpit and automatically open firewall port
hosts: managed_hosts
become: true
gather_facts: true

vars:
    cockpit_enabled: true
    cockpit_started: true
    cockpit_manage_firewall: true

tasks:
    - name: Dynamically install Cockpit and open firewall
    ansible.builtin.include_role:
        name: suse.linux_system_roles.cockpit
```

- cockpit_enabled: true: controls the systemd service setting for the Cockpit Web Console. cockpit_enabled is a Boolean datatype and accepts values true and false. Default is true, which means the Cockpit service is configured to start automatically at system boot.
- cockpit_started: true: controls the immediate runtime status of the Cockpit Web Console service. cockpit_started is a Boolean datatype and accepts values true and false. Default is true, which means the Cockpit service is running immediately on the managed host.
- cockpit_manage_firewall: true: delegates the task of configuring the firewall to the role itself, ensuring the Cockpit web interface is network-accessible. cockpit_manage_firewall is a Boolean datatype and accepts values true and false.

Default is <u>false</u>, which means the role installs and enables Cockpit but makes no changes to the firewall, leaving that task to be handled manually or by a separate dedicated firewall role.

For more details about all the variables in the Cockpit Linux system role, refer to the specific REDADME.md file on the control node:

/usr/share/ansible/collections/ansible_collections/suse/linux_system_roles/docs

6 About the HA cluster Linux system role

The HA cluster Linux system role in Ansible is designed to fully install, configure and manage a Pacemaker and Corosync High Availability (HA) cluster on SUSE Linux Enterprise Server for SAP applications 16.0 systems.

You can use this role to:

- Automate the installation of core cluster components like Pacemaker and Corosync.
- Create and initialize a robust, multi-node High Availability cluster.
- Configure fencing devices to ensure true node isolation and data integrity upon failure.
- Define and manage cluster resources, such as floating IP addresses, application services, and shared storage mounts.
- Set resource constraints and dependencies to control which nodes run specific services.
- Enable and manage cluster services across the defined cluster nodes.
- Ensure consistent HA setup across multiple environments, adhering to best practices and minimizing manual errors.

EXAMPLE 6: CONFIGURE FIREWALL AND SELINUX FOR MANAGED NODES

```
    name: Configure firewall and selinux for managed nodes
    hosts: managed_nodes
    become: true
    gather_facts: true
```

```
vars:
    ha_cluster_manage_firewall: true
    ha_cluster_manage_selinux: true

tasks:
    - name: Manage firewall and selinux
    ansible.builtin.include_role:
        name: suse.linux_system_roles.ha_cluster
```

- ha_cluster_manage_firewall: true: It controls whether the role should automatically configure the system's firewall to permit necessary cluster communication. ha_cluster_manage_firewall is a Boolean datatype and accepts values true,false,yes,no, 0 and 1. When set to true, it automatically adds firewall rules to open the necessary ports for the cluster to function. Default is false.
- ha_cluster_manage_selinux: true: Controls whether the HA cluster role will automatically configure the SELinux policy to allow cluster processes to function. ha_cluster_manage_selinux is a Boolean datatype and accepts values true,false,yes,no, 0 and 1. When set to true, it manages SELinux and performs actions like setting the correct SELinux contexts on necessary files and directories, enabling or setting SELinux booleans required for cluster services etc. Default is false.

EXAMPLE 7: CREATE PCSD TLS CERTIFICATES AND KEY FILES

```
- name: Manage HA cluster with TLS certificates and key files
hosts: managed_nodes
become: true
gather_facts: true

vars:
    ha_cluster_pcsd_certificates:
    - name: FILENAME
        common_name: "{{ ansible_hostname }}"
        ca: self-sign

tasks:
    - name: Manage firewall and selinux
    ansible.builtin.include_role:
        name: suse.linux_system_roles.ha_cluster
```

This example creates self-signed <u>pcsd</u> certificate and private key files in <u>/var/lib/pcsd</u> with the file name FILENAME.crt and FILENAME.key.

• ha_cluster_pcsd_certificates: is a list of dictionaries used to define TLS certificates for the pcsd service. The default is []. It uses the structure of the underlying certificate system role. The certificate specific keys are ca, common_name and cert basename. These keys are all string data types.

For more details about all the variables in the HA cluster Linux system role, refer to the specific README.md file on the control node:

/usr/share/ansible/collections/ansible_collections/suse/linux_system_roles/docs

7 About the SUSEconnect Linux system role

The SUSEconnect Linux system role in Ansible manages SUSE Linux system registrations with SUSE Customer Center or a SMT server. It automates the process of registering and deregistering systems, as well as managing additional products and modules on a SUSE system.

You can use this role to:

- Register a SUSE system to the SCC or servers.
- Activate or remove of specific add-on products or modules.
- Deregister systems or products.
- Support transactional update register SLE-MICRO.
- Recheck tasks to ensure a smooth registration process.
- Ensure compatibility with public cloud environments.

EXAMPLE 8: REGISTER A SUSE LINUX ENTERPRISE SERVER FOR SAP APPLICATIONS 16.0 SYSTEM

```
---
- name: Register with SCC and activate modules
hosts: managed_nodes
become: true
gather_facts: true

vars:
suseconnect_base_product:
```

- <u>suseconnect_base_product</u>: defines the required parameters for registering the core operating system of a SUSE Linux machine. <u>suseconnect_base_product</u> is defined as a YAML Dictionary containing key-value pairs that map directly to the requirements of SCC or SMT servers. Accepted string values are <u>key</u>, <u>product</u>, <u>version</u> and arch.
- <u>suseconnect_subscriptions</u>: is a crucial component for enterprise SUSE deployments, as it controls which features, for example, High Availability, containers, or web application platforms enabled on the registered base operating system. <u>suseconnect_subscriptions</u> is defined as a YAML Dictionary containing key-value pairs that map directly to the requirements of SCC or SMT servers. Accepted string values are name, state, version and key.

EXAMPLE 9: DEREGISTER BASE PRODUCTS

```
---
- name: Deregister products from SCC
hosts: managed_nodes
become: true
gather_facts: true

vars:
    suseconnect_deregister: true

tasks:
    - name: Deregister products from SUSE Customer Center
    ansible.builtin.include_role:
        name: suse.linux_system_roles.suseconnect
```

• <u>suseconnect_deregister</u>: <u>true</u>: instructs the system to deactivate its base subscription and remove it from the the SCC or SMT servers. <u>suseconnect_deregister</u> is a <u>Boolean</u> datatype and accepts values <u>false</u> and <u>true</u>. When set to <u>true</u>, it executes the necessary SUSEConnect command to deregister the system's base product subscription. Default is false.

For more details about all the variables in the SUSEConnect Linux system role, refer to the specific README.md file on the control node:

/usr/share/ansible/collections/ansible_collections/suse/linux_system_roles/docs

8 About the Journald Linux system role

The Journald Linux system role in Ansible is designed to configure and manage the systemd-journald service on SUSE Linux Enterprise Server for SAP applications 16.0 systems.

The role automates changes to /etc/systemd/journald.conffile. You can use this role to:

- Determine where journal logs are stored. Logs can be stored temporarily in memory or persistently on the disk.
- Set hard limits on how much disk space the journal can consume before old logs are deleted.
- Configure how much disk space the journal should always leave free for other system uses.
- Control whether journal data objects should be compressed to save space.
- Configure whether log data is kept separate for individual users.
- Manage the running state of the systemd-journaldservice.

EXAMPLE 10: CONFIGURE PERSISTENT STORAGE, LIMIT DISK USAGE, ENABLE USER LOGGING AND SET SYNCHRONIZATION FREQUENCY

```
---
- name: Configure persistent storage, limit disk usage, enable user logging and set synchronization frequency
hosts: managed_nodes
become: true
gather_facts: true

vars:
```

```
journald_persistent: true
    journald_max_disk_size: 1024
    journald_per_user: true
    journald_sync_interval: 1

tasks:
    - name: Configure persistent storage, limit disk usage, enable user logging
and set synchronization frequency
    ansible.builtin.include_role:
        name: suse.linux_system_roles.journald
```

- journald_persistent: true: instructs journald to create the _/var/log/journal directory and store logs permanently. journald_persistent is a Boolean datatype and accepts values accepts values true and false. Default is false.
- journald_max_disk_size: 1024: limits the total disk space the journal files may use up to 1 Gigabyte (1024 MB). journald_max_disk_size is an integer datatype and accepts an integer representing a size in megabytes (MB). No value is explicitly configured by this role; therefore, the default sizing logic from man 5 journald.conf applies.
- journald_per_user: true: Enables per-user logging. Logs are kept separate for individual users, allowing unprivileged users to read logs related only to their own services. journald_per_user is a Boolean datatype and accepts values true, false, yes, no, 0 and 1. Default is false.
- journald_sync_interval: 1: limits the total disk space the journal files may use up to 1 Gigabyte (1024 MB). journald_max_disk_size is an integer datatype and accepts an integer representing a time span in minutes. By default role does not alter currently used value.

EXAMPLE 11: CONFIGURE JOURNALD FOR PERSISTENT STORAGE AND DISK LIMITS

```
---
- name: Configure systemd-journald for persistent storage and disk limits hosts: managed_nodes become: true gather_facts: true

vars:
    journald_persistent: true journald_max_disk_size: 1024

tasks:
```

```
name: Configure journald for persistent storage and disk limits
ansible.builtin.include_role:
name: suse.linux_system_roles.journald
```

- journald_persistent: true: instructs journald to create the _/var/log/journal directory and store logs permanently. service is a Boolean datatype and accepts values accepts values true, false, yes, no, 0 and 1. Default is false.
- journald_max_disk_size: 1024: limits the total disk space the journal files may use up to 1 Gigabyte (1024 MB). journald_max_disk_size is an integer datatype and accepts an integer representing a size in megabytes (MB). No value is explicitly configured by this role; therefore, the default sizing logic from man 5 journald.conf applies.

For more details about all the variables in the journald Linux system role, refer to the specific README.md file on the control node:

/usr/share/ansible/collections/ansible_collections/suse/linux_system_roles/docs

9 About the Podman Linux system role

The Podman Linux system role in Ansible automates the deployment and lifecycle management of containers as system services at scale, ensuring consistent and often rootless container orchestration across an infrastructure.

You can use this role to:

- Ensure the necessary Podman packages and related tools are installed and updated.
- Automate the prerequisite setup for running containers as unprivileged users. Also includes managing the correct entries in /etc/subuid and /etc/subgidfiles.
- Manage the creation, starting, stopping and removal of containers.
- Leverage Podman's deep integration with <u>systemd</u> by automatically generating <u>systemd</u> unit files (or Quadlet files on newer systems) to manage containers and pods as persistent services that start automatically at boot.
- Deploy complex multi-container workloads defined using standard Kubernetes YAML manifests.

```
- name: Manage podman root containers and services
 hosts: managed_hosts
 become: true
 gather_facts: true
 vars:
   podman_firewall:
     - port: 8080/tcp
       state: enabled
   podman_kube_specs:
      - state: started
       kube file content:
         apiVersion: v1
         kind: Pod
         metadata:
           name: test1-httpd
         spec:
           containers:
             - name: test1-httpd
                image: registry.access.suse.com/test1/httpd-24
                  - containerPort: 8080
                    hostPort: 8080
                volumeMounts:
                  - mountPath: /var/www/html:Z
                    name: test1-html
           volumes:
              - name: test1-html
                persistentVolumeClaim:
                  claimName: test1-html-volume
 tasks:
   - name: Dynamically install Cockpit and open firewall
     ansible.builtin.include_role:
       name: suse.linux_system_roles.podman
```

In this example, a Kubernetes pod <u>test1-httpd</u> running an HTTP server container from the <u>registry.access.suse.com/test1/httpd-24</u> image. The container's web content is mounted from a persistent volume named <u>test1-html-volume</u>. By default, the role creates rootful containers.

- podman_firewall: controls the necessary firewall configurations on the host to ensure container ports are accessible. It is a list of dictionaries, where each dictionary
 defines a single firewall rule for a container. The accepted values are specified as keyvalue pairs within these dictionaries. The most common and crucial keys accepted
 within each dictionary item are port, state, zone and masquerade. Default is an
 empty list [] or null.
- podman_kube_specs: defines and manage Podman containers or pods based on Kubernetes YAML specifications. It is a list of dictionaries and each dictionary item defines one container or pod deployment and requires one of the following keys to specify the Kubernetes YAML source: kube_file_src or kube_file_content. Default is an empty list [] or null.

For more details about all the variables in the Podman Linux system role, refer to the specific README.md file on the control node:

/usr/share/ansible/collections/ansible_collections/suse/linux_system_roles/docs

10 About the certificate Linux system role

The certificate Linux system role in Ansible automates the entire lifecycle of TLS and SSL certificates on managed Linux hosts.

You can use this role to:

- Generate the private key and the Certificate Signing Request (CSR) locally on the managed node, ensuring the private key never leaves the host.
- Handle the submission of the CSR to a designated Certificate Authority (CA).
- Save the newly issued certificate, key, and CA chain files to the correct, secure locations on the file system, managing file ownership and permissions.
- Set up mechanisms such as <u>certmonger</u> to automatically monitor the certificate's expiration date and attempt renewal before it expires.

EXAMPLE 13: ISSUE A SELF SIGNED CERTIFICATE

```
---
-name: Issue a self signed certificate
```

```
hosts: managed_nodes
become: true

vars:
    certificate_requests:
        - name: mycert
            dns: *.example.com
            ca: self-sign

tasks:
        - name: Issue a self signed certificate
            ansible.builtin.include_role:
                 name: suse.linux_system_roles.certificate
```

• certificate_requests: defines the specific details of the certificates the role needs to issue, manage, or renew. It is a list of dictionaries and each item in the list is a dictionary specifies the properties of one unique certificate to be managed. The default is an empty list []. If this list is empty, the role performs no certificate management actions. Each dictionary within the certificate_requests list must define at least the certificate name and the issuing Certificate Authority. Other parameters specify the key size, subject, and domains. In this example, name, ca are string data types and required. dns can be either a list or string and is optional.

You can find the directory at:

- Certificates: /etc/ssl/certs
- Keys: /etc/ssl/certs/private

EXAMPLE 14: ISSUE A CERTIFICATE AND KEY AND SPECIFY LOCATION TO PLACE THEM

```
-name: Issue a certificate and specify location
hosts: managed_nodes
become: true
gather_facts: true

vars:
    certificate_requests:
        - name: test/path/mycert
            dns: *.example.com
            ca: self-sign

tasks:
        - name: Issue a certificate and specify location
```

```
ansible.builtin.include_role:
  name: suse.linux_system_roles.certificate
```

This example creates a certificate file in /test/path/mycert.crt and a key file in /test/path/mycert.key.

For more details about all the variables in the certificate Linux system role, refer to the specific README.md file on the control node:

/usr/share/ansible/collections/ansible_collections/suse/linux_system_roles/docs

11 About the Crypto policies Linux system role

The Crypto policies system role in Ansible is to establish the rules, guidelines, and standards for the proper and effective use of cryptography on SUSE Linux Enterprise Server for SAP applications 16.0 systems.

You can use this role to:

- Specify when and how different types of data must be encrypted.
- Ensure that organizations adheres to legal, regulatory and industry mandates that require specific, strong cryptographic controls for data protection.
- Prohibit the use of weak, outdated, or known-vulnerable algorithms and protocols, thereby reducing the risk of a security breach.
- System-wide cryptographic policy that provides a centralized way for administrators to configure core cryptographic like TLS, SSH, etc. so that most applications use a default, secure configuration.
- Specify when and how different types of data must be encrypted.
- Define the procedures for the entire lifecycle of cryptographic keys.
- Mandate which cryptographic algorithms are approved for use, ensuring a consistent, secure level of protection across all systems and applications.

```
EXAMPLE 15: ENFORCE FUTURE POLICY
```

- - -

```
- name: Enforce the 'FUTURE' system-wide cryptographic policy
hosts: managed_nodes
become: true
gather_facts: true

vars:
    crypto_policies_policy: "FUTURE"
    crypto_policies_reload: true
    crypto_policies_reboot_ok: false

tasks:
    - name: Enforce the FUTURE policy
    ansible.builtin.include_role:
        name: suse.linux_system_roles.crypto_policies
```

- <a href="mailto:crypto_policies_policy:"FUTURE": is used to system-wide cryptographic settings on compatible Linux distributions. crypto_policies_policyis a string-datatype and accepts values DEFAULT, FUTURE, LEGACY and custom policies that Administrators can define. Default is null.
- crypto_policies_reload: true: ensures that the new cryptographic policy takes effect immediately by attempting to restart or reload services that rely on the system's cryptographic libraries. crypto_policies_reload is a Boolean datatype and accepts values true and false can define. Default is true.
- crypto_policies_reboot_ok: false: dictates whether the playbook is permitted
 to automatically reboot the managed server after changing the cryptographic policy. crypto_policies_reboot_okis a Booleandatatype and accepts values true and
 false can define. Default is false.

EXAMPLE 16: CONFIGURES THE DEFAULT CRYPTO POLICY LEVEL WITHOUT SHA1

```
- name: Manage crypto policies
hosts: managed_nodes
become: true
gather_facts: true

vars:
    crypto_policies_policy: "DEFAULT:NO-SHA1"
    crypto_policies_reload: false

tasks:
    - name: Configure default crypto policy level without SHA1
    ansible.builtin.include_role:
```

- crypto_policies_policy: "DEFAULT:NO-SHA1: is used to system-wide crypto-graphic settings on compatible Linux distributions. crypto_policies_policy is a stringdatatype and accepts values DEFAULT, FUTURE, LEGACY and custom policies that Administrators can define. Default is null. In this example, you are using the DEFAULT policy as a starting point and then modifying it with the built-in NO-SHA1 sub-policy.
- crypto_policies_reload: false: ensures that the new cryptographic policy takes
 effect immediately by attempting to restart or reload services that rely on the system's
 cryptographic libraries. crypto_policies_reloadis a Booleandatatype and accepts
 values true and false can define. Default is true.

For more details about all the variables in the Crypto policies Linux system role, refer to the specific README.md file on the control node:

12 About the MSSQL Linux system role

The MSSQL Linux system role in Ansible automates the installation, configuration and initial deployment of Microsoft SQL Server (MSSQL) on SUSE Linux Enterprise Server for SAP applications 16.0 systems.

You can use this role to:

- Install the necessary SQL Server packages and tools.
- Manages the acceptance of the End-User License Agreement (EULA), which is required for installation.
- Set the required System Administrator <u>sa</u> and <u>mssql_password</u>. This is a mandatory variable for initial setup.
- Configures the TCP Port the server listens on.
- Manages TLS/SSL certificates to ensure encrypted connections to the database.
- Optimize the operating system for database performance and throughput, by applying the mssql Tuned profile.

```
- name: Install and configure basic Microsoft SQL Server
hosts: managed_nodes
become: true
gather_facts: true

vars:
    mssql_accept_microsoft_sql_server_standard_eula: true
    mssql_password: "{{ sa_secret_password }}"
    mssql_edition: "Developer"

tasks:
    - name: Manage basic Microsoft SQL Server
    ansible.builtin.include_role:
        name: suse.linux_system_roles.mssql
```

- mssql_accept_microsoft_sql_server_standard_eula: explicitly confirms the user agrees to the Microsoft SQL Server End-User License Agreement (EULA). It is a mandatory Boolean datatype and accepts values true or false. It must be set to true in your playbook or inventory for the role to proceed with the installation of SQL Server. If set to false, the installation tasks will fail or be skipped. The default is empty{}.
- <u>mssql_password</u>: sets the password for the Administrator <u>sa</u> user. It is a mandatory <u>string</u> datatype. The password must have a minimum length of 8 characters, include uppercase and lowercase letters, base 10 digits or non-alphanumeric symbols. Default is null.
- <u>mssql_edition</u>: defines the specific version of Microsoft SQL Server to be installed on the host. It is a mandatory <u>string</u> datatype and accepts values <u>Enterprise</u>, <u>Standard</u>, <u>Web</u>, <u>Developer</u>, <u>Express</u>, <u>Evaluation</u> and a product key in form of <u>#####-####-####-####</u> where # is a number or letter. Default is null.

For more details about all the variables in the MSSQL Linux system role, refer to the specific README.md file on the control node:

```
/usr/share/ansible/collections/ansible_collections/suse/linux_system_roles/docs
```

13 About the SELinux Linux system role

The SELinux Linux system role in Ansible automates the full management and enforcement of the SELinux policy on managed nodes in a standardized and idempotent way.

You can use this role to:

- Set the global SELinux mode to <u>enforcing</u>, <u>permissive</u> or <u>disabled</u> using the <u>selinux</u> state variable.
- Manage the state of SELinux booleans.
- Define persistent rules for file system labeling (file contexts) for custom directories or applications.
- Define security types for non-standard network ports, allowing services to listen on them without violating the policy.
- Manage the mapping between Linux user accounts and specific SELinux user identities.

EXAMPLE 18: RESET THE SELINUX CONTEXT

```
- name: Reset the selinux context
hosts: managed_nodes
become: true
gather_facts: true

vars:
selinux_restore_dirs:
    - /var/www/
    - /etc/

tasks:
    - name: reset the selinux context
ansible.builtin.include_role:
    name: suse.linux_system_roles.selinux
```

• <u>selinux_restore_dirs</u>: specifies file system paths on the managed node where the SELinux contexts should be immediately reapplied or corrected (using the equivalent of the <u>restorecon</u> utility). It is a list of strings, where each string is a file system tree where you want to run restorecon.

EXAMPLE 19: SET A SELINUX NETWORK PORT LABEL

```
- name: set a selinux port label
hosts: managed_nodes
become: true
gather_facts: true

vars:
    selinux_ports:
        - ports: 8080
            proto: tcp
            setype: http_port_t
            state: present

tasks:
        - name: set a selinux port label
            ansible.builtin.include_role:
            name: suse.linux_system_roles.selinux
```

selinux_ports: manages the SELinux port labeling policy on a managed node. It is a
list of dictionaries with each dictionary defining a specific port rule. ports are strings
or a list and define port numbers to which you want to assign the SELinux label.
Multiple values separated by a comma are accepted. proto is a string datatype and
defines the network protocol. setype is a string datatype and defines the SELinux
type (label) to assign to the port.

For more details about all the variables in the SELinux Linux system role, refer to the specific REDADME.md file on the control node:

/usr/share/ansible/collections/ansible_collections/suse/linux_system_roles/docs

14 About the SSH Linux system role

The SSH Linux system role in Ansible automates the configuration and management of the Secure Shell (SSH) service on SUSE Linux Enterprise Server for SAP applications 16.0 systems.

You can use this role to:

- Enforce security best practices on the SSH daemon.
- Set default client options for all managed users.
- Deploy public keys for specific users to enable passwordless access.
- Define which users or groups are permitted to log in via SSH.

EXAMPLE 20: MANAGE SSH CLIENTS

```
- name: Manage ssh clients
 hosts: managed nodes
 become: true
 gather_facts: true
 vars:
     ssh_user: root
       Compression: true
       # wokeignore:rule=master
       ControlMaster: auto
       ControlPath: ~/.ssh/.cm%C
       Match:
          - Condition: "final all"
           GSSAPIAuthentication: true
       Host:
          - Condition: example
           Hostname: example.com
            User: user1
     ssh_ForwardX11: false
  tasks:
    - name: manage SSH clients
     ansible.builtin.include_role:
       name: suse.linux_system_roles.ssh
```

- <u>ssh_user</u>: is a role specific variable used to determine the scope of the SSH client configuration being deployed. The default value is <u>null</u> or undefined, which means the role is configured to manage the global, system-wide SSH client configuration, which is located at /etc/ssh/ssh config on the managed node.
- ssh_ForwardX11: controls whether X11 forwarding should be automatically enabled when establishing an SSH connection to a remote host. It determines if the graphical interface environment (X Window System) of the remote host should be tunneled securely back to the local client machine, allowing the user to run remote graphical applications. It is a Boolean datatype with values yes and no.

For more details about all the variables in the SSH Linux system role, refer to the specific README.md file on the control node:

/usr/share/ansible/collections/ansible_collections/suse/linux_system_roles/docs

15 About the systemd Linux system role

The systemd Linux system role in Ansible automates the full lifecycle management and deployment of systemd units and configurations SUSE Linux Enterprise Server for SAP applications 16.0 systems.

You can use this role to:

- Place custom or templated systemd unit files such as . timer etc. into the correct directories /etc/systemd/system/.
- Control the execution status of services, allowing you to easily start, stop, restart, or reload specific units.
- Control whether units are configured to start automatically at boot or are prevented from doing so.
- Use the most aggressive method to prevent a service from ever running or being manually started by setting the unit as masked.

EXAMPLE 21: START AND ENABLE A SYSTEMD UNIT

```
- name: Deploy and start a systemd unit
  hosts: managed nodes
  become: true
  gather facts: true
  vars:
    systemd_unit_file_templates:
     - test.service.j2
    systemd_started_units:
      - item: test.service
        user: root
      - item: test1.service
       user: user1
    systemd enabled units:
     - test.service
  tasks:
    - name: Manage a systemd unit
      ansible.builtin.include role:
        name: suse.linux_system_roles.systemd
```

- systemd_unit_file_templates: specifies a list of Jinja2 template file names residing on the control node that should be rendered and deployed as full systemd unit files on the managed nodes. It is a list of strings or dictionaries. Each item specifies a Jinja2 template file located in the role's templates/ directory. Default is an empty list [] or null.
- systemd_started_units: specifies which systemd units should be set to the started
 state on the managed nodes. It is a list of strings or dictionaries. Default is an empty
 list [].
- systemd_enabled_units: specifies which systemd unit files should be enabled on
 the managed nodes, ensuring they start automatically at boot. It is a list of strings
 or dictionaries. Default is an empty list []

For more details about all the variables in the systemd Linux system role, refer to the specific README.md file on the control node:

/usr/share/ansible/collections/ansible_collections/suse/linux_system_roles/docs

16 About the time synchronization Linux system role

The time synchronization Linux system role in Ansible automates the configuration and enforcement of system time synchronization on managed Linux hosts. NTP and PTP are essential standards used to synchronize computer clocks across a network. Accurate time synchronization is crucial because many critical network services rely on precise time to function correctly.

You can use this role to:

- Install and configure the preferred time synchronization service such as Chrony or NTPD.
- Set the list of reliable time servers like NTP peers and servers the system should synchronize with.
- Ensure the system uses the desired synchronization method.
- Helps ensure that systems are compliant with security requirements that mandate accurate logging and synchronized authentication, for example, Kerberos.

EXAMPLE 22: INSTALL AND CONFIGURE NTP TO SYNCHRONIZE THE SYSTEM CLOCK WITH MANAGED NODES

```
- name: Manage timesync
 hosts: managed nodes
 become: true
 gather_facts: true
 vars:
   timesync_ntp_servers:
     hostname: ntp.example.com
       iburst: true
     - hostname: time.example.com
       iburst: true
     - hostname: sync.example.com
       iburst: true
 tasks:
   - name: Manage timesync
       ansible.builtin.include_role:
       name: suse.linux system roles.timesync
```

• <u>timesync_ntp_servers</u>: is a primary mechanism for an administrator to specify which external network time sources (NTP servers) the managed Linux host should use for clock synchronization. It is a list of dictionaries. The default is an empty list[]. Each dictionary entry within the <u>timesync_ntp_servers</u>list defines a single time source and its desired configuration options. In this example, <u>hostname</u> is a required string datatype and iburst is an optional Boolean datatype.

EXAMPLE 23: INSTALL AND CONFIGURE LINUXPTP

```
- name: Manage timesync in PTP domain 0, interface eth0
hosts: managed_nodes
become: true
gather_facts: true

vars:
   timesync_ptp_domains:
        - number: 0
        interfaces: [eth0]

tasks:
        - name: Manage linuxptp
        ansible.builtin.include_role:
        name: suse.linux_system_roles.timesync
```

• <u>timesync_ptp_domains</u>: configures Precision Time Protocol (PTP) synchronization It is a list of dictionaries. Default is an empty list []. In this example, <u>number</u> is a required string datatype and interfaces are optional list of strings data types.

For more details about all the variables in the time synchronization Linux system role, refer to the specific README.md file on the control node:

```
/usr/share/ansible/collections/ansible_collections/suse/linux_system_roles/docs
```

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