



# Discover SUSE® Manager

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All Your IT Assets in a Simple,  
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# Reduce Complexity and Administer All Your IT Assets in a Simple, Consistent Way

SUSE® Manager is a best-in-class open source infrastructure management solution that lowers costs, enhances availability and reduces complexity for lifecycle management of Linux systems in large, complex and dynamic IT landscapes. You can use SUSE Manager to configure, deploy and administer thousands of Linux systems running on hypervisors, as containers, on bare metal systems, IoT devices and third-party cloud platforms.

Your SUSE Manager server offers a single, convenient user interface for managing:

- Configuration
- Deployment
- Software updates
- Provisioning
- System monitoring
- Auditing

Use SUSE Manager to administer Linux server and client systems (both virtual and hardware-based) running locally, remotely, in the cloud or in HA clusters. SUSE Manager is tightly integrated with SUSE Enterprise Linux. You can also use SUSE Manager to administer openSUSE, Red Hat, CentOS (included in expanded support) and Ubuntu. A powerful collection of automation and orchestration features make SUSE Manager an ideal solution for DevOps environments.

And even if your organization doesn't use DevOps techniques, you can still save money and time with the integrated collection of services available through SUSE Manager. The latest release of SUSE Manager unveils a new generation of features that extend the power of SUSE Manager and help you keep airtight control over your Linux assets (see the box entitled "New in SUSE Manager").

## New in SUSE Manager

SUSE Manager offers powerful new features such as:

- Lower operating costs through simplified lifecycle management
- Expanded monitoring and alerting with Prometheus
- New SAP HANA and HA cluster deployment capabilities
- Enhanced real-time management for virtual systems
- SUSE Manager is based on SUSE Linux Enterprise 15 SP1, with Python 3 and OpenJDK 11.



**Figure 1.** SUSE Manager makes it easy to build and deploy system images.

SUSE Manager enables you to maintain control of all your Linux servers as they grow and change, automating tasks that would otherwise take days or weeks of admin time. Use SUSE Manager for...

### Easy Linux Deployment

Declare how many Linux systems you need and what you need them for. SUSE Manager does the rest.

SUSE Manager can handle local and remote deployments. You can build your own plain ISO images (Figure 1), as well as images for containers or virtual machines, or you can automate scripted installations using either AutoYaST or Kickstart. You can then install those images on individual computers or groups of systems in fully unattended fashion.

Integration with the Cobbler installation server enables efficient deployments via Preboot Execution Environment (PXE). In addition to SUSE Linux Enterprise, it is possible to use SUSE Manager to install openSUSE and Red Hat systems. And now that SUSE Manager is a base SUSE Linux Enterprise product, it is even easier to deploy in your business ecosystem.

### Hassle-Free Software Updates

SUSE Manager automates software updates for both whole systems and single packages. A powerful security system guarantees that every package is centrally authorized and classified before it is installed. SUSE Manager is the only tool that allows automatic, online service pack migration even if you skip a service pack (e.g., go from SP1 to SP3). Thanks to the Salt configuration management system, you can schedule and execute multiple software upgrades and other operations as one block, using one command.

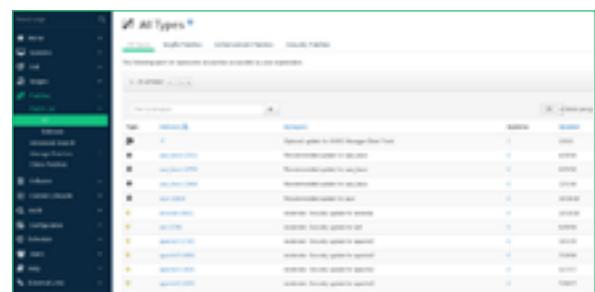
### SDI

SUSE Manager is part of a new generation of software-defined infrastructure (SDI) tools. A single SDI can consist of many thousands of objects, running on any possible mix of compatible hardware and cloud platforms. SDI tools enable you to manage objects on the network in a hardware- and location-independent method. All systems on the network are managed the same way, regardless of how they are deployed (hypervisors, containers, bare metal) and where (IoT devices, dedicated servers, private or public cloud platforms).

### Monitoring, Reporting and Auditing

Once SUSE Manager “captures” an asset, it is never lost. SUSE Manager logs all activities, and administrators can define which parties can access information or modify the system. If a server goes offline, SUSE Manager quickly notices and reports it.

You can group and classify all managed systems (e.g., by location, rack, vendor, role or CPU architecture) for easier visualization and more granular reporting. The SUSE Manager dashboard offers a detailed view of systems and processes running on the IT landscape, down to the patch status of each individual Linux installation (Figure 2). As you will learn later in this paper, SUSE Manager also supports real-time monitoring of managed systems using the Prometheus open source monitoring platform. You can prepare detailed analyses of system performance using Prometheus.



**Figure 2.** A listing of patches, which includes information about available updates.

## Security

SUSE Manager supports automatic, system-wide configuration and vulnerability scans, using either CVE lists or the OpenSCAP protocol. You can search for Common Vulnerabilities and Exposures (CVE) numbers in all patches released by SUSE or generate custom reports of all the machines affected by a specific CVE (Figure 3).

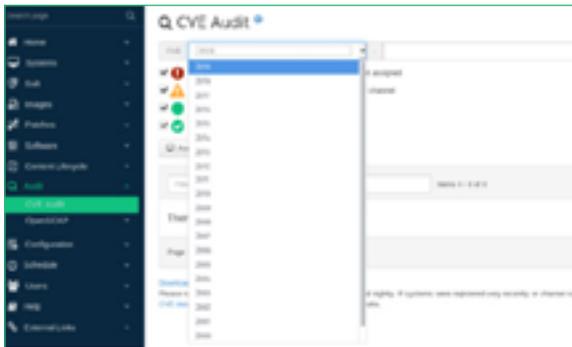


Figure 3. Scanning for known vulnerabilities.

## Guaranteed Compliance

SUSE Manager enforces key best practices to ensure compliance. You can monitor all deployments on the network and watch for “shadow IT”—systems installed or reconfigured without central authorization.

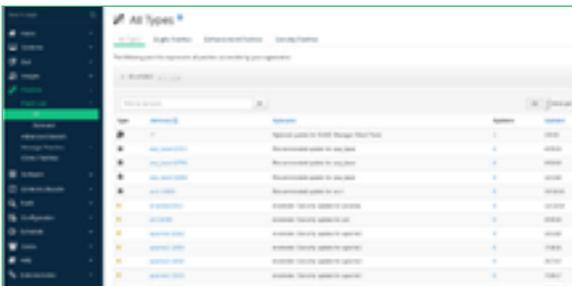


Figure 4. Monitoring compliance with SUSE Manager.

SUSE Manager creates a single inventory of all the managed Linux systems inside an organization (Figure 4). Once that inventory is available, SUSE Manager can report on any deviation from compliance. For example, the automated patch-management functions generate daily notifications of systems not compliant with the current patch level.

### System Requirements

- **Supported Processor Platforms:** Multi-core 64-bit CPU (x86-64; IBM z Systems and LinuxONE; IBM POWER8 or POWER9 processor-based server in little endian mode)
- **RAM:** Minimum 4GB for test, 16GB for base installation, 32GB for a production server
- **Disk Space:** Minimum 100GB for root partition, minimum 50GB for /var/lib/pgsql, minimum 50GB per SUSE product and 360GB per Red Hat product for /var/pacewalk

## Better Teamwork

Adoption of SUSE Manager facilitates efficient allocation of human resources in IT departments, as well as optimal planning of management operations. The main administrator of a SUSE Manager installation can delegate different tasks to other users at different levels. You can subdivide the IT landscape and provide separate administrators for each subgroup. It is also possible to give different admins responsibility for different tasks, such as key activation, images, configuration and software channels (Figure 5).

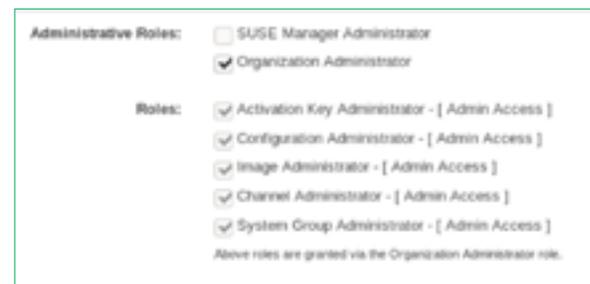


Figure 5. Lock down security by assigning a role to each system admin.

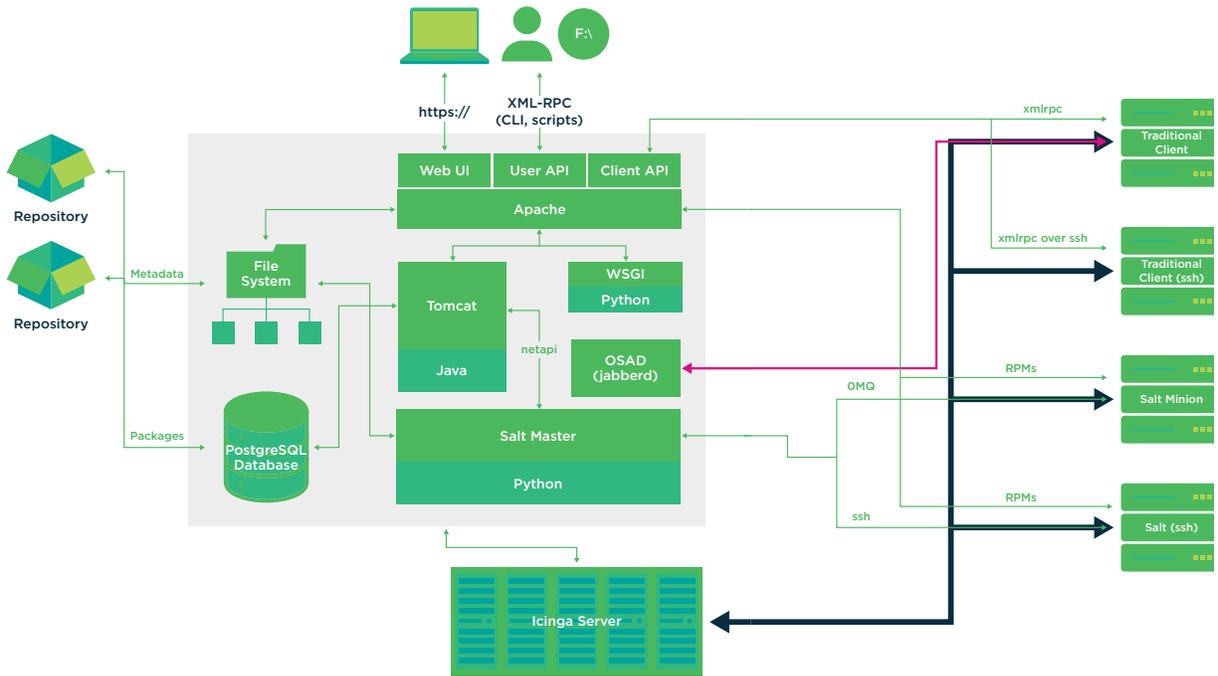


Figure 6. SUSE Manager architecture.

### How SUSE Manager Works

SUSE Manager has a modular architecture based on mature, powerful open source servers and communication protocols (Figure 6). The front-end web interface and user/client APIs for third-party applications run on top of the Apache web server. The logic for web applications, software repositories and system data is handled by Tomcat. Low-level SUSE Manager services are handled by Python applications, and the foundation of the whole platform is the Salt Configuration Management system.

In addition to the APIs, several utilities enable the integration of SUSE Manager with existing tools and processes.

The SUSE Manager server includes the web-based user interface, an embedded PostgreSQL database and connectivity with the SUSE Customer Center. This package must be installed using

a valid SUSE Manager Server registration code (which is version-independent) on a physical or virtual server behind a company firewall. Updates from versions older than 3.2 are not supported.

For those who prefer to work without the web interface, the server command-line tool `spacecmd` can be scripted to use virtually all of the functions of SUSE Manager without any interaction, either at the console or in the web interface. For more advanced automation, a complete XML-RPC API exists.

The companion of the actual SUSE Manager server is a Proxy Server, which lowers bandwidth needs and provides faster local updates for environments with many servers or in environments spanning different geographical locations. SUSE recommends a minimum of one proxy server per 500-1,000 clients for optimal performance.

## User Interface

SUSE Manager's web-based user interface is efficient and well-organized, enabling users to move easily among the functions and services to keep a clear view of network resources. An always-ready sidebar menu gives constant access to all the high-level functions and components of your IT landscape.

The Home Overview page contains shortcuts to all the essential operations you must perform to get started (Figure 7).



**Figure 7.** The Home Overview window contains links to all essential operations.

Within easy reach is a context-sensitive legend for the symbols used by SUSE Manager, a breadcrumb navigation menu, buttons to quickly go back to the top of each window and a dedicated search box.

After you finish the initial configuration, the System Set Manager (SSM) provides an efficient way to administer many systems simultaneously. Select the systems you want to manage, and the main SSM window gives you quick access to all the controls you need to apply configuration states, schedule patch updates, group or migrate systems and much more.

## Software Channels

SUSE Manager automates the installation and updating of software packages, which are stored on the network and made available only through software channels. A software channel groups packages by product or application to simplify software distribution (Figure 8). One common use of software channels is to keep software for testing and development separate from packages reserved for production systems.



**Figure 8.** Software channels help you keep control of software installation.

A client system can have subscriptions to multiple software channels. Channels come in two different types:

- **Base Channels** consist of packages built for a specific architecture and release. For example, all of the packages in SUSE Linux Enterprise Server 12 for the x86\_64 architecture make up a base channel. A system must subscribe to only one base channel.
- **Child Channels** are always associated with a base channel and provide extra packages for it. Each system can subscribe to multiple child channels. A child channel that is available for every base channel is the one for SUSE Manager Tools; it contains the utilities needed to connect clients with the SUSE Manager server.

SUSE Manager administrators can create, clone and delete custom channels. These channels may contain standard or custom packages, which could be customized versions of standard packages or in-house creations packaged in RPM or DEB format. Channels can be automatically assigned at installation or system registration time or changed later.

## Configuration Management

SUSE Manager manages the configuration using centrally-located files delivered through configuration channels. All systems subscribe to channels and receive configuration files stored in those channels.

In a trusted network, thanks to a new auto-discovery feature, SUSE Manager Salt clients (called Salt minions) will find their Salt master without the need for additional configuration. If a client is not capable of acting as a Salt minion, Salt can still manage the configuration in “agentless” mode if you set the `enable_ssh_minions` option in SUSE Manager. This option tells Salt to create an SSH connection to the client and send Salt-equivalent commands.

SUSE Manager extends the automatic configuration capabilities of Salt through its support for action chains. Action chains are sequences of actions that are executed as if they were a single command. An action chain enables you to use a single command to specify a complex task that consists of several steps. Examples of chainable actions include rebooting the system (even in between other configuration steps on the same system!), installing or updating software packages and building system images.

SUSE Manager also supports a new add-on feature for enhanced management of virtual machines through Salt. This new feature enables you to manage virtual machines on remote systems through a single user interface that provides convenient features such as start/stop buttons. For example, you can create a Salt state that ensures that the same virtual machine images will run on all your branch servers.

## Provisioning

In SUSE Manager, the initial registration for a system can happen in different ways, even through a plain SSH connection. Configuration management takes place by defining the product type and nature, defining the configuration system (Salt or file-based management), setting the location and configuring the necessary software channels. When the system is up and running, all those parameters, together with the system’s status and its planned maintenance schedule, are visible in one single window (Figure 9).

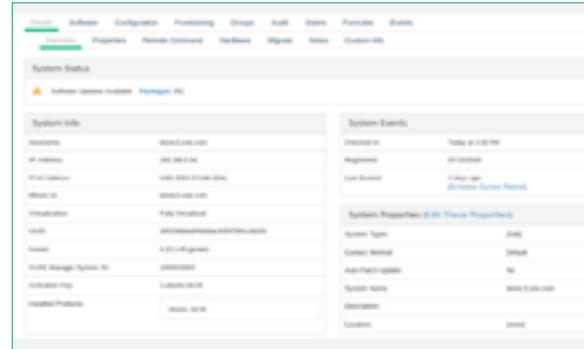


Figure 9. Displaying the system status and maintenance record.

## Task Management and Scheduling

SUSE Manager enables you to execute many kinds of tasks automatically and keep track of them all (Figure 10). You can quickly schedule, browse or archive everything that happens to:

- Software packages and channels (installation, removal, rollbacks or upgrades)
- Single systems or groups of systems (automated installations, reboots, patching, configuration changes and hardware updates)

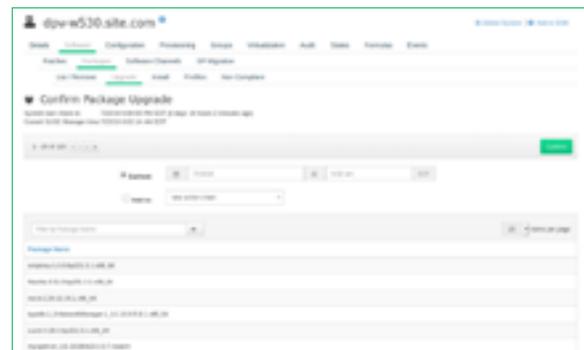


Figure 10. Scheduling package updates.

## Package Management

The SUSE Manager Package Search functions help administrators to quickly find all the packages of a certain type, in all the software channels that they are authorized to access—or on all the systems for which they have responsibility (Figure 11). You can easily check the dependencies of each package or see if a newer version is available. The same search interface also returns a list of all the systems on which a certain package is installed, along with important information about the package (applied patches, subscribed software channels and more).

SUSE Manager simplifies management and reduces operational expenditure with enhanced package staging through a new Content Lifecycle user interface and improved APIs for managing packages, patches and configurations.

## SAP HANA Deployment

The SAP business toolset is a core component of many enterprise IT environments. SUSE has a 20-year history of working closely with SAP, and over 90 percent of all SAP HANA implementations run on SUSE Enterprise Server. If your business already uses SAP, or if you are considering deploying SAP/HANA, you'll find that SUSE Manager is the ideal management tool for your SAP configuration. SUSE Manager also includes new Salt Formulas with Forms capabilities that make it easy to set



Figure 11. Searching for a software package.

up SAP nodes and cluster configurations (see the box entitled “Salt and Formulas with Forms”). Formulas for bootstrapping and managing high availability SAP/HANA clusters are handled through the cluster management shell, `crmschr`.

### Salt and Formulas with Forms

Salt is a state-based configuration management system that enables you to define the configuration for an application or computer system in a declarative format. A state file contains a declaration for the configuration of a system, application or component. The Salt client (called a Salt minion) receives the declaration, and Salt configures the component by applying the desired configuration defined in the state file. A complex system such as a Linux server or client might receive configurations from several Salt states.

A formula is a collection of state files that group configuration items together. They're frequently used to define all configuration required for the system to take a certain role, for example a web or database server. Salt formulas can be about anything from installation and configuration of single software packages (or whole Linux distributions) to system-wide settings such as users, groups or disk partitions.

Salt is a powerful tool for organizing and automating system configuration across the IT landscape. SUSE Manager comes with many preconfigured Salt formulas, which you can tailor to your own needs. For instance, SUSE Manager includes Salt formulas for setting up SAP HANA nodes and HA cluster configurations.

You can also use SUSE Manager to create custom Salt formulas through ordinary web forms. SUSE Manager's Formulas with Forms makes it easy to create your own formulas, as well as to apply them to single systems or whole groups. Once the formula is created, an admin can easily assign the formula to one system or a group of systems and use the forms to parametrize the formulas as required.

### Content Lifecycle Management

With the help of a new CLM user interface, SUSE Manager makes it possible to clone complete hierarchies of software channels through a lifecycle of several environments. This new tool enables you to create content projects, select a custom set of software channels as sources and blacklist specific packages and patches. With your sources chosen, you can build the selected set, which will then populate your first environment. That environment can then be promoted through the environment lifecycle.

With the help of CLM, the process of managing packages, patches and configurations throughout your IT workflow has not only become more powerful, but also more streamlined.

### Prometheus/Grafana Support

SUSE Manager comes with Prometheus, which is an open source system monitoring and alerting toolkit, whereas Grafana is an open platform for analytics and monitoring. This integration enables you to monitor nearly anything you like on a system. If you don't find a Prometheus exporter to fit your needs, you can even build your own and have it integrated with SUSE Manager. And with the help of Blackbox Monitoring, you can probe endpoints over HTTP(S), DNS, TCP and ICMP and easily measure service latency.

With the help of the SUSE Manager/Prometheus integration, you can work with querying metrics (using the functioning expression language, PromQL). These metrics can easily filter multi-dimensional time series (such as HTTP internal server errors per second alerts) and make use of regex matching.

Alerts are also an outstanding feature available with the SUSE Manager/Prometheus integration. Alert Manager takes care of duplicating, grouping and routing with alert rules (written in PromQL); supports HA setups; integrates with email, PagerDuty and OpsGenie; and can be "plugged" into your existing scripts.

### Conclusion

SUSE Manager is much more than the best platform for managing SUSE Linux. You get a powerful, fully open source, future-proof platform that reduces complexity and enables you to administer all your IT assets in a simple and consistent way. Strong support for Red Hat and Ubuntu means you can manage your entire Linux infrastructure using a single tool. SUSE Manager provides full support for your SDI and is especially well-suited for enterprise DevOps environments. SUSE Manager also helps you to ensure compliance with internal security policies and external regulations. New features provide Prometheus-based system monitoring with alerts, as well as enhanced support for deploying and maintaining the powerful SAP business toolset, and Single Sign-On for simplified admin authentication.

### To Learn More About SUSE Manager

- For detailed product specifications and system requirements, visit: [www.suse.com/products/suse-manager](http://www.suse.com/products/suse-manager)
- For Uyuni details and development, visit: [www.uyuni-project.org](http://www.uyuni-project.org)



# Thank You

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