



# DATASHEET **SERVERware**



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# SERVERware Editions

## **STANDALONE EDITION**

SERVERware's Standalone Edition enables customers to install it on a single server. Because this edition's processing power and data storage are provided by a single server, it does not provide high availability for hosted services.

## **MIRROR EDITION**

The Mirror Edition adds a layer of protection to your data. To provide high availability of hosted services, two identical servers (primary/secondary) must be connected in a back-to-back configuration. Data is synchronized in real time between these servers (from primary to secondary). The Mirror Edition is comparable to the Standalone Edition in terms of VPS computing capacity, as virtual servers run exclusively on the primary server.

## **CLUSTER EDITION**

The Cluster Edition is comparable to the Mirror Edition, except that it includes the option to extend the processing capability of the VPS by adding more hosts. While it is possible to run virtual servers on the mirror, this is not encouraged given the mirrored pair of servers' principal job in the Cluster Edition is to offer fault-tolerant storage to a number of processing hosts. Virtual private servers (VPS) running on processing hosts save their data on the storage server. To effectively offload VPS processing from the mirrored pair and use it only for storage, two or more extra hosts devoted to VPS processing must be provided during the Mirror to Cluster edition upgrade.

## Fault Tolerance

	standalone	mirror	cluster
<p><b>Fault Tolerance</b></p> <p>The SERVERware storage component is made of two identical servers (active-standby) connected back-to-back to provide storage for virtual servers running on the SERVERware network's processing servers.</p> <p>The fault tolerance feature of SERVERware is based on redundant components inside the storage system.</p> <p>If the active storage server fails, the standby server will instantly take over the storage serving.</p> <p>From the perspective of processing hosts and virtual servers running on them, storage services are not disrupted.</p>	○	○	●

## High Availability

	standalone	mirror	cluster
<p><b>High Availability</b></p> <p>Because the data for all virtual servers are saved on the fault-tolerant storage component, virtual servers can be readily transferred to any processing host and continue to run using the most recent data. If a processing host fails, the SERVERware controller will immediately distribute and start the failed virtual servers on the remaining available hosts in the SERVERware network.</p> <p>SERVERware achieves this by ensuring the high availability of the hosted virtual servers without causing data loss.</p>	○	●	●

## Scalability

	standalone	mirror	cluster
<p><b>Storage Scalability</b></p> <p>Since the SERVERware storage is based on OpenZFS, we can easily expand the size of the storage pool by adding additional drives to the storage hosts.</p>	●	●	●



<p><b>Processing Scalability</b></p> <p>Extending the processing power of the SERVERware network is as simple as adding more processing hosts.</p>	○	○	●
<b>Virtualization</b>			
	standalone	mirror	cluster
<p><b>Support for Cgroup2</b></p> <p>The VPS isolation of device access control is ported on cgroup2. The option to limit the number of cores per VPS for better distribution and CPU utilization among multiple VPSs on the same host.</p>	●	●	●
<p><b>KVM</b></p> <p>SERVERware’s implementation of KVM can run unmodified Linux containers as VPSs which can either be PBXware or Docker containers fetched as OCI images from Docker Hub and similar sources. Additionally, one can pack and distribute service software using open standards and tools.</p>	●	●	●
<b>Web Control Panel</b>			
	standalone	mirror	cluster
<p><b>System Dashboard</b></p> <p>The Dashboard section is a visual representation of SERVERware most significant performance indicators. It displays the overall number of virtual servers as well as the number of active virtual servers. There’s also a counter for the total number of active calls across the SERVERware network.</p> <p>Because the storage server is such an important part of the SERVERware network, memory and storage utilization indications represent the storage server’s status.</p> <p>There are also logs of recent system activity and a list of alerts that have been activated.</p>	●	●	●
<p><b>Total Number of Calls Within SERVERware</b></p> <p>SERVERware’s call statistics display the overall number of calls made on a given day, week, or month.</p>	●	●	●

<p><b>MOST ACTIVE VPS Widget</b></p> <p>The “MOST ACTIVE VPS” chart will allow an administrator to easily identify a VPS that is causing the system to have a significant I/O load.</p>	●	●	●
<p><b>Storage Pool Fragmentation Monitoring</b></p> <p>Storage pool fragmentation monitoring allows administrators to be notified when the pool fragmentation percentage exceeds the specified threshold (default value is 80 percent ).</p>	●	●	●
<p><b>Dashboard Widget Host Local Storage Allocation</b></p> <p>The “LOCAL STORAGE” dashboard will display the amount of local storage allocated to the processing hosts that have local storage.</p>	●	●	●
<p><b>Meeting Service Statistics on SERVERware Dashboard</b></p> <p>SERVERware will collect statistics from the meeting service in the same way as it collects call information. The dashboard provides access to the statistics.</p>	●	●	●
<p><b>Overcommitment of Resources View on Dashboard (Memory, Storage)</b></p> <p>The over-commitment of storage and memory resources will be reflected in the existing pie-chart on the dashboard for easy visualization. The graph depicts a ratio of virtually allocated to physically available resource amount.</p>	●	●	●
<p><b>Secure Access For Support (BSSUP)</b></p> <p>Password-free and safe access to certified Bicom Systems support. Simplifies firewall management by allowing access to the controller's SSH access port solely from the outside.</p> <ul style="list-style-type: none"> <li>• Control when and on which port, and for how long the access is open.</li> <li>• Monitor active sessions and audit log.</li> </ul>	●	●	●
<p><b>i18n</b></p> <p>SERVERware’s user interface can be translated to other languages thanks to the integration with the Weblate platform.</p>	●	●	●

## Host Management

A host is a physical 64-bit server that runs a customized version of Gentoo Linux that includes the packages needed to run virtual servers. There are three types of hosts, each with a different purpose: STORAGE, PROCESSING, and BACKUP.

You can use the Host Management view to add, edit, and remove SERVERware hosts, as well as to conduct management duties on those that are available. Furthermore, performance indicators provide the current host load and health of each host for a clearer picture of resource conditions.



## Partition Management

Partitions are logical groups that include real resources, users, and virtual servers. A partition's primary use is to set administrative boundaries for the management of virtual private servers. A partition might represent a person, a department, or an organization.

The Partition Management page allows you to add a new partition as well as execute some partition management operations. You can set a resource quota for each partition in terms of partition members, virtual servers, RAM, and storage space. There are also visual indicators for each partition's current domain quota use. For the VPS networking purpose, each partition can be assigned a partition administrator as well as a range of IP addresses.

Partitions are formerly known as domains.



<p><b>VPS Management</b></p> <p>The VPS Management view enables users to create new VPSs and update existing VPS configurations.</p> <p>When building or editing a VPS, you can choose a processing host domain to which the VPS belongs, a resource flavor in terms of CPU, memory, and storage allocation, and an IP address from a predefined domain IP address pool.</p> <p>The following VPS administration actions are supported:</p> <ul style="list-style-type: none"> <li>• Start</li> <li>• Stop</li> <li>• Freeze</li> <li>• Copy (make a new VPS using data of existing one)</li> <li>• Move (transferring a VPS from one processing host to another), and</li> <li>• Restore (recreate from a backup)</li> </ul>	●	●	●
<p><b>VPS Advanced Options</b></p> <p>Exclude VPS from Backup and Enable Protected Mode for VPS have been included as new features. A VPS protected by the system administrator cannot be stopped or restarted if it is already running, nor can it be altered or removed by domain members.</p>	●	●	●
<p><b>Evacuating VPSs from a Processing Host</b></p> <p>Evacuate all VPSs that are currently running on a processing host owing to maintenance operations as soon as possible. If nothing else is supplied, the Evacuate VPSs action will remove all VPSs from the selected host and distribute them across the other hosts in the cluster.</p> <p>It is also possible to reverse the evacuation of VPSes to the original host. The undo evacuate feature will only impact VPSs that have not been changed or migrated since the evacuation.</p>	○	○	●



<p><b>IOPS Limit</b></p> <p>The resource tab of the VPS Add/Edit dialog allows you to limit VPS resources in terms of IOPS. The default values for the IOPS limit are inherited from the resource flavor that was chosen.</p>	●	●	●
<p><b>Number of CPU Cores Pinned to a VPS</b></p> <p>Administrators can manage CPU cores per VPS via the VPS edit menu. Even after the VPS has been formed, you can adjust the CPU usage.</p>	●	●	●
<p><b>Add Memory High Usage Throttle Limit Per VPS</b></p> <p>Additional memory high-use handling for VPSs, so that processes are throttled and put under a lot of pressure to free up memory when possible. This will help the stability of memory-hungry services.</p> <p>SERVERware to set cgroup2 memory controller “memory.high” to 85% of “memory.max”.</p>	●	●	●
<p><b>Edit VPS MAC Address through the GUI</b></p> <p>SERVERware administrators are able to edit the MAC addresses for VPSs through the SERVERware GUI. The MAC address will be preserved on takeover, unless it is already in use on the cluster, in which case a new one will be generated.</p>	●	●	●
<p><b>Clone VPS Action</b></p> <p>In the GUI, there is a network address field for cloned VPSs; this allows the VPS to be launched immediately when cloning is complete.</p>	●	●	●
<p><b>Exclude Clone from Backup</b></p> <p>When cloning VPSs, administrators are able to select whether that clone will be excluded from the next backup cycle directly from the Clone VPS pop-up window.</p>	●	●	●



<p><b>VPS Snapshots</b></p> <p>Take snapshots of VPSs through the SERVERware GUI.</p> <p>Supported actions are:</p> <ul style="list-style-type: none"> <li>• create and remove snapshot,</li> <li>• remove all snapshots,</li> <li>• rollback to to the point in time when the snapshot was created,</li> <li>• create a clone of the snapshot.</li> </ul>	●	●	●
<p><b>Volume Shrinking through the SERVERware GUI</b></p> <p>Shrinking VPS volumes through the user interface. SERVERware will automatically calculate the required volume size based on the data used in the volume.</p>	●	●	●
<p><b>Reclaim Free Space</b></p> <p>With the click of a button, you can return unneeded space to the storage pool. This feature will assist SERVERware admins in better managing available storage space. The 'TRIM' button will be visible only when there is a space available to be reclaimed.</p>	●	●	●
<p><b>VPS Storage Trimming, Cancel Button</b></p> <p>VPS trim cancel option is added in case the storage trim operation can take longer than expected. The trim button on the VPS Storage info panel will change to Cancel while trimming is in progress. Clicking on the 'Cancel' button will stop the trimming operation and attach the VPS volume.</p>	●	●	●
<p><b>Restore VPS for Removed VPSes</b></p> <p>Restoring VPSes from the recycle bin has been redesigned.</p>	●	●	●

<p><b>VPS Templates</b></p> <p>Software packages that can be downloaded and installed on SERVERware, including PBXware.</p> <p>Sorted in three categories:</p> <ul style="list-style-type: none"> <li>• Official templates: Bicom Inc. original software,</li> <li>• Community templates: third party software available for easy install and use,</li> <li>• OCI Registries: where admins can add registries to download OCI images from.</li> </ul>	●	●	●
<p><b>Signed Official and Community Templates</b></p> <p>All Official and Community templates are automatically signed with an encrypted private key after they are built and published to the official Bicom Systems registry. SERVERware will verify the signature upon template installation and warn the user in case the selected template is not signed with the appropriate key, or signed at all.</p>	●	●	●
<p><b>OCI Images Support</b></p> <p>Support for fetching from the OCI registries and creating a SERVERware template from the OCI image format.</p> <p>This service will enable SERVERware administrators to create a system, service, or application templates on their own from OCI image repositories such as Docker Hub.</p>	●	●	●
<p><b>OCI Runner Template</b></p> <p>Template that automatically provides a docker container engine, used to run OCI images and third party apps in SERVERware. The OCI Runner will automatically pull and start an app.</p>	●	●	●
<p><b>Volume Mapping</b></p> <p>Allows mapping directories or files on the VPS and docker container that is running inside it, enabling data to be shared and persisted between them.</p>	●	●	●

<p><b>IPv6</b></p> <p>SERVERware supports IPv6 addressing for all core components. This means that administrators will be able to assign static IPv6 addresses to hosts and VPSs, use IPv6 addresses as alternate addresses for GR, assign and resolve AAAA records, and have sipPROT detect and block attacks from IPv6 addresses.</p>	●	●	●
<p><b>Ability to Add Different Gateway for Each Domain and Override the Default Gateway</b></p> <p>SERVERware administrators can specify a different gateway, instead of the default gateway, per partition.</p>	●	●	●
<p><b>Optimized Networking for Custom Subnetting</b></p> <p>Subnetting within SERVERware is now made easier with the new option to add custom subnets consisting of one to two IP addresses, and the ability to assign a default gateway from a wider range.</p>	●	●	●
<p><b>Virtual Network</b></p> <p>Administrators have the option to define an additional virtual network at the level of the SERVERware cluster for interconnecting VPSs on the same cluster. SERVERware relies on the WireGuard communication protocol to define virtual private networks (VPNs) that are the foundation of SERVERware virtual networks. These networks are, by design, encrypted, providing a secure way to protect the communication between VPS hosted on the cluster. Consequently, one can define a dedicated virtual network for a partition, enabling the VPSs belonging to the partition to communicate through it securely. The other VPSs that belong to other partition hosted on the same cluster will not be able to see the traffic.</p> <p>Virtual networks on SERVERware are IPv4 in private IPv4 ranges of class A, B, or C, and IPv6 only with local private unicast prefixes.</p>	●	●	●
<p><b>Public Internet Access for VPS Inside a Virtual Network (IPv4)</b></p> <p>This enables individual virtual networks to access the public internet, so that VPSes belonging to a virtual network can communicate with external services.</p>	●	●	●

<p><b>Virtual Networks Do Not Require a LAN Interface Inside a VPS</b></p> <p>We have brought the virtual networking feature to a level up and made it work even without requiring a LAN interface inside a VPS. This means we can create a virtual network to be used for internal communication between app components running on different VPSs, and we do not need to spend LAN IP addresses for this.</p>	●	●	●
<p><b>DNS &amp; NAPTR/SRV</b></p> <p>SERVERware’s Controller comes with an integrated DNS (Domain Names System) server, allowing it to be configured as an authoritative server for a DNS zone. DNS is a protocol that converts domain names like bicomsystems.com into the IP address of an internet server.</p>	●	●	●
<p><b>CNAME DNS Records for VPSs</b></p> <p>It is possible to create multiple CNAME records for a single VPS with different DNS names that will still be resolved to the same IP address by the SERVERware Controller.</p>	●	●	●
<p><b>DNS NAT Support</b></p> <p>With SERVERware supports for DNS for systems that are behind NAT. With the added External Address field, admins can now specify public IPs for each VPS for systems that are behind NAT, meaning that if the Controller is used as the authoritative DNS server, it will resolve DNS/NAPTR queries to the IP specified in the External Address field. This is also applied to GR, to ensure functionality post-takeover.</p>	●	●	●
<p><b>Support for DNS Zone Transfer</b></p> <p>DNS Zones in SERVERware allows for an easier DNS configuration when handling multiple sites and Geo Redundancy.</p> <p>DNS zones of the primary and secondary sites will resolve the same A and AAAA records.</p>	●	●	●
<p><b>Management Network</b></p> <p>MAN is a dedicated, automatically configured virtual interface on each host and the controller that is used for safe communication between SERVERware components running on different hosts in the cluster. Establishing the MAN interface limits the surface area for attackers while dramatically increasing SERVERware’s security.</p>	●	●	●



<p><b>Statistics</b></p> <p>The SERVERware statistics module collects information on resource usage by hosts and virtual private servers. Data on a variety of metrics are collected at regular intervals, processed, and preserved in the database before being displayed and reviewed via the GUI. The performance charts graphically illustrate CPU, memory, network, and concurrent calls metrics for SERVERware-managed hosts and virtual private servers.</p> <p>You can choose a period for which to display charts and compare performance charts between hosts or VPSes.</p>	●	●	●
<p><b>Alarms</b></p> <p>SERVERware includes an integrated alerting and notification system known as Alarms. The administrator is notified immediately when something goes wrong, or ideally before the problem starts. The system monitoring module monitors physical and virtual resources in real-time intending to generate an alarm and send a warning.</p> <p>Administrators can customize Alarms to notify them when specified SERVERware network circumstances or statuses occur.</p>	●	●	●
<p><b>Notification Per User</b></p> <p>Alarms and Events can be managed in GUI for every user on the system.</p>	●	●	●
<p><b>SSL Settings</b></p> <p>SERVERware comes with the option to manage and upload SSL certificates through the GUI. Administrators can now:</p> <ul style="list-style-type: none"> <li>• generate CSRs from the GUI,</li> <li>• upload and install SSL certificates,</li> <li>• obtain a certificate using the domain verification process (DNS challenge),</li> <li>• revoke an SSL certificate,</li> <li>• manually renew an active SSL certificate.</li> </ul> <p>Automated SSL certificate installation is also extended to support for ACME servers that require External Account Binding.</p>	●	●	●

<p><b>2FA for SERVERware</b></p> <p>By requiring two means to validate your identity, multi-factor authentication improves access security.</p>	●	●	●
<p><b>Access Control Management</b></p> <p>Manage trusted and blocked IP addresses for accessing the SERVERware GUI, as well as configure the automatic lockout following failed login attempts.</p>	●	●	●
<p><b>Limited Number of Active GUI Sessions Per User</b></p> <p>The number of active sessions is now limited to prevent idle sessions from filling the logs and improve security. To use this feature, it has to be enabled in the system settings. There is an option to enter the number of maximum connections manually.</p>	●	●	●
<p><b>User Management</b></p> <p>There are four types of users: Administrator, Partition Member, VPS Admin and VPS Owner. Administrators have full permission on the system, while Partition Members have been assigned role permissions on a domain of which they are a member.</p> <p>Domain Members are further divided into Domain Administrator, VPS Administrator, and VPS Owners, with different permission levels assigned to them.</p>	●	●	●
<p><b>API Tokens</b></p> <p>SERVERware supports creating API tokens for managing VPSs. The API permissions are tied the user's permissions.</p>	●	●	●
<b>sipPROT</b>			
	standalone	mirror	cluster
<p><b>sipPROT Management</b></p> <p>The integrated sipPROT GUI lets you manage sipPROT configuration as well as Allow/Deny lists for all hosts in the SERVERware network, as well as Dynamic Deny lists.</p>	●	●	●

<p><b>sipPROT Dashboard</b></p> <p>The sipPROT dashboards provides a clear overview of blocked attacks, Geo-IP data, and the overall health status of the firewall.</p>	●	●	●
<p><b>GeoIP Blocking</b></p> <p>This feature enables allowing/blocking IP addresses based on GeoLocation. With this feature our customers can prevent attacks from specific countries.</p>	●	●	●
<p><b>Attack Logs</b></p> <p>sipPROT's Attack Logs will display logs of all SIP attacks on the system with the intention to provide a better insight into the security of the entire system and allow administrators to apply additional measures if necessary.</p>	●	●	●
<p><b>sipPROT Dynamic Deny List Shows Blocked User Agent</b></p> <p>The sipPROT dynamic deny list shows the exact user agent after a successfully stopped attack.</p>	●	●	●
<p><b>Additional Improvements</b></p> <ul style="list-style-type: none"> <li>• Checkbox for multi select and bulk removal of IP addresses.</li> <li>• IP address sorting by number ascending/descending in GUI.</li> <li>• Allow/deny list import/export from CSV file.</li> <li>• Allow/deny lists now have a NOTE field.</li> <li>• E-mail daily reports will contain the country name.</li> <li>• sipPROT protection for multiple SIP ports.</li> <li>• CSV templates for allowlist and denylist.</li> </ul>	●	●	●
<p><b>Reporting Service</b></p> <p>sipPROT's reporting service will send out notifications in case the system is currently under attack. sipPROT will also daily reports of blocked attacks for the day and will notify the administrator in case of TFTP attacks.</p>	●	●	●

# Geo-Redundancy

	standalone	mirror	cluster
<p><b>Geo-Redundancy</b></p> <p>Allows the user to take over services at a remote location with minimal data migration, depending on the rate of data replication between sites. Two or more geographical locations are used to store data generated by services.</p> <ul style="list-style-type: none"> <li>• Incremental replications.</li> <li>• Maintain several replication cycles at the replication site in real-time.</li> <li>• Takeover of control from several points in time.</li> <li>• On the takeover site, data synchronization is separated from operational services and does not affect them.</li> </ul>	●	●	●
<p><b>Ability to Replicate VPSs Running on Local Storage on Processing Hosts</b></p> <p>VPSs running on processing hosts using local storage can be replicated to a geo-redundancy server.</p>	○	○	●
<p><b>Ability to Assign Multiple IPs for VPS Takeover</b></p> <p>For GR sites that have more intricate networking, with multiple network cards and network interfaces assigned to hosts and VPSs, SW administrators can now assign multiple alternate IPs for each network interface added to a VPS.</p>	●	●	●
<p><b>Ability to Sort Backup/Replication Tasks</b></p> <p>Backups and replications may now be sorted by VPS name, start time, and state, allowing easy browsing of completed backups and replications.</p>	●	●	●
<p><b>Set a Start Time for Replications</b></p> <p>Allows for scheduling replications on the hour.</p>	●	●	●
<p><b>Remove Replications</b></p> <p>SERVERware administrators will now be able to remove old or unnecessary VPS replications from the GR pool more easily, by simply selecting the replication they wish to remove and then clicking on the remove button.</p>	●	●	●



<p><b>Added a Warning for Insufficient Bandwidth for Replications</b></p> <p>In case the network speed is too low for successful replications, a warning will be displayed notifying the administrator while the replication is in progress. Once the replication is completed, the notification will also appear on the Replication Details side panel. The warning will be triggered in case the transfer rate is less than 25 Mbps.</p>	●	●	●
<p><b>Geo-Redundancy “Bulk Takeover Templates” Redesign</b></p> <p>For a better user experience, we have decided to reorganize the Geo-Redundancy bulk takeover page by exposing the “Bulk Takeover Templates” list in the primary visible tab. Hence, it is accessible for the Administrator to act quickly if necessary. Also, a new button, “START/EDIT”, is available next to every template listed.</p>	●	●	●
<p><b>Site Monitoring and Automatic Takeover</b></p> <p>Site monitoring enables the SERVERware administrator to configure remote site monitoring by developing a set of tests that will report whether the monitored site is available or not. If any or all tests fail, the following actions may be taken:</p> <ol style="list-style-type: none"> <li>1. Initiate the alarm notification process.</li> <li>2. Initiate the template takeover.</li> </ol>	●	●	●
<b>Backup</b>			
	standalone	mirror	cluster
<p><b>Backup Legacy</b></p> <p>SERVERware includes a backup tool as a solution for VPS data recovery in the event of a system failure, user mistake, or application error. There are two backup options available: full and full/incremental.</p> <p>Additionally, the backup can be set to include all VPSs or specific domains. There is an option to choose the destination server and backup retention.</p>	●	●	●

<p><b>Backup To ZFS</b></p> <p>SERVERware’s new built-in backup tool “BACKUP to ZFS” is a cutting-edge solution for VPS data recovery in the event of a system failure, user, or application error.</p> <p>ZFS backup is an incremental SERVERware backup based on “ZFS send,” which uses less storage than legacy backup and has less of an impact on system performance overall I/O, CPU consumption.</p>	●	●	●
<p><b>Backup VPSs Running on Processing Hosts with Local Storage</b></p> <p>VPSs running on processing hosts with local storage can be backed up to the same backup server as VPSs on NETSTOR.</p>	○	○	●
<p><b>Restore VPS From the Backup Browse View</b></p> <p>Ability to initiate a restore action of a VPS found on the attached backup host through the backup browse view so we can restore VPS servers in case of a disaster.</p> <p>Only one VPS restore process can run at a time.</p>	●	●	●
<p><b>Restore From Backup Legacy and ZFS</b></p> <p>The ability to search for and restore VPSs from backup hosts. When a VPS is selected, its metadata will be displayed on the form. The user can choose the target host, domain, and, if necessary, a new VPS name.</p> <p>Following that, the VPS can be added to the bulk action queue by selecting the appropriate button.</p>	●	●	●
<p><b>Option to Specify Datasets for Backup</b></p> <p>When setting backup tasks, the pool is provided in one dropdown list as before, and now datasets dropdown is provided. When a pool is selected, backup datasets of that pool and root dataset are loaded in the dataset dropdown.</p>	●	●	●
<p><b>Ability to Remove VPS Backups</b></p> <p>This feature will make managing backups of VPSes easier, as administrators will be able to remove backups of VPSes that have been moved and deleted.</p>	●	●	●
<p><b>Backup &amp; Restore, Browse &amp; Takeover: Sort by Name, Size</b></p> <p>This provides easier manipulation of backup and GR datasets.</p>	●	●	●

# Command Line Interface

	standalone	mirror	cluster
<b>Console</b> In addition to the SERVERware management options available in the GUI, there is a basic set of operations that can be performed via the shell, such as starting and stopping a VPS and accessing its shell.	●	●	●
<b>Replaced Root Access With Administrator User Access</b> SERVERware no longer has root user access, and the default user is now an administrator account called "swadmin." This modification also enables us to use homebrew to install applications (not packaged by your host distribution) to your home directory.	●	●	●
<b>SERVERware logs for Brute-Force/Dictionary SSH Attacks are Detected and Redirected to the Different Log File</b> The ssh session logs are now saved in "/var/log/ssh"; these logs are also rotated.	●	●	●
<b>Ability to Access VPS Console from SERVERware GUI</b> The news from the SERVERware just got better, the new TTY session button in the GUI for quick access directly to the VPS console. In case of misconfigured ssh, custom templates without an ssh client or for any other reason ssh might be inaccessible. TTY session will provide easy access for troubleshooting. This is the internal SERVERware service, so it does not depend on the status of services in the VPS.	●	●	●
<b>sipPROT Improvements</b> <ul style="list-style-type: none"><li>• CLI autocomplete is added for sipPROT commands.</li><li>• CLI check if the given IP is in some of the lists (e.g., sipPROT check 192.168.0.1).</li></ul>	●	●	●
<b>Snapshot of the TOP Processes When IO_WAIT Alarm is Triggered</b> When the IO WAIT alert is triggered, an automatic snapshot of the processes using the majority of IO resources is taken. Snapshot of processes will contribute to better debugging and provide more information on system performance.	●	●	●



<p><b>Ability to Refresh SERVERware License through the Controller CLI</b></p> <p>CLI users are able to refresh the SERVERware license through the Controller command line interface. update-license will send a request to the licensing server through the sw-wcp service.</p>	●	●	●
<b>Reports</b>			
	standalone	mirror	cluster
<p><b>System Logs</b></p> <p>The System logs page displays information on SERVERware events and allows you to track down and debug issues.</p>	●	●	●
<p><b>Centralized System Logs</b></p> <p>Every processing computer in the cluster will create a local log and deliver it to the storage server via TCP.</p> <ul style="list-style-type: none"> <li>• Useful when you need to check logs from the processing host even if the host is not available</li> <li>• It is also simpler to check recent logs on each computer in the cluster from a single location</li> </ul>	●	●	●
<p><b>Quickly Filter the Logs on the Reports Section</b></p> <p>An option to filter records of System Logs and Alarm Logs for columns Host, Module, and Severity, so it would be easier to filter only, for example, all CRITICAL errors on a CONTROLLER so that recurrent events can be more easily traced.</p>	●	●	●
<p><b>Audit Log</b></p> <p>In SERVERware the Audit Log is added as a part of the Reports sub-menu, to collect information, improve diagnostics and decision making for SERVERware admins and support personel when troubleshooting.</p>	●	●	●
<p><b>PBXware License in the SERVERware VPS View</b></p> <p>The SERVERware VPS view contains information on the PBXware license. When migrating to another VPS, there is also a reload button to reset the license.</p>	●	●	●



<p><b>VPS List CSV Export</b></p> <p>Possibility of exporting a CSV list of VPSs at a particular time with all accessible VPS data. This information is extremely useful for upgrading, reinstalling, rebooting, or maintaining server hardware or software.</p>	●	●	●
<b>Install &amp; Setup Wizard</b>			
	standalone	mirror	cluster
<p><b>Install &amp; Setup</b></p> <p>SERVERware may be installed from either a DVD or a USB disk using a simple installation wizard that will walk you through the process one step at a time.</p>	●	●	●
<p><b>Setup/Install Will Remove all Filesystem Signatures From Disk Before Adding it into Pool</b></p> <p>SERVERware install/setup guarantees that all prior filesystem signatures are removed from disk, preventing udev mappings by partition label confusion and setup failure.</p>	●	●	●
<p><b>IANA Timezone Database to Cities</b></p> <p>In the SERVERware setup process, time zone selection is now available per city; this makes selecting the correct time zone much more intuitive.</p>	●	●	●
<p><b>Installation of SERVERware Backup Server</b></p> <p>SERVERware Backup Host is now available for configuring a backup server, and it allows the user to define disk arrays during installation.</p>	●	●	●
<p><b>Setup - Restore Feature</b></p> <p>In such cases when the user is reinstalling the storage/controller server which had the previous setup completed, the install wizard will detect the previous setup and offer the restore option to the user.</p>	●	●	●

<p><b>Install Wizard to Create ZFS Pools on OS disks</b></p> <p>Upon installation, the install wizard will automatically detect available disks for the SERVERware operating system and suggest possible ZFS pool configurations based on the selected number of disks. Depending on the chosen configuration, the install wizard will create a pool for the operating system. Available configurations include stripe, mirror and RAID Z.</p>	●	●	●
<p><b>Storage Hot Spare Disk</b></p> <p>Setup of hot spare disks in the storage pool, monitoring of the storage pool, and automatic replacement of faulty disks with spare disks, per server.</p>	●	●	●
<p><b>Default IP Pool Range for VPS</b></p> <p>The user will be prompted to choose an initial IP pool, which will then be passed to CONTROLLER as part of the first startup settings. As a result, SERVERware will be ready to start creating VPSs and using them as soon as the setup is finished.</p>	●	●	●
<p><b>Allow Choice of IP Address for Second Servers SAN &amp; RAN</b></p> <p>SAN/RAN IP of secondary server is automatically selected, visible, and can be changed if necessary.</p>	●	●	●
<p><b>Storage Pool Info</b></p> <p>When the HDD must be replaced, the user can indicate which HDD is faulty by looking at the serial number in the setup wizard disk array.</p> <ul style="list-style-type: none"> <li>• Display pool topology.</li> <li>• Drive serial number, size, and type.</li> <li>• iSCSI connection.</li> <li>• Read, write and checksum errors.</li> </ul>	●	●	●

<p><b>VLAN Tagging on the Host and VPS Interfaces</b></p> <p>802.1Q VLAN frames are distinguished from ordinary Ethernet frames by the insertion of a 4-byte VLAN tag into the Ethernet header. VLAN tagging is used to tell which packet belongs to which VLAN on the other side. A packet is tagged with a VLAN tag in the Ethernet frame to make recognition easier. It is now possible to enable VLAN tagging in the SERVERware setup wizard while configuring the network.</p>	●	●	●
<p><b>New SERVERware Setup Wizard GUI</b></p> <p>As a part of our future goals of SERVERware, we have a redesigned setup wizard, new technology, more responsive, GREAT looking with the same simple steps to finish the setup in no time. The best description is to take a look.</p>	●	●	●
<p><b>NVMe/TCP</b></p> <p>In the storage pool assembly, NVMe/TCP is introduced as a replacement for iSCSI. This enables NVMe/TCP configuration of mirror/cluster SERVERware editions, allowing for improved utilization of hardware resources, lower latency, and the elimination of the RAN link bottleneck. NVMe/TCP storage performance is up to eight times quicker than previous versions. On the same hardware, it is possible to run up to 30% more VPSs.</p>	○	●	●

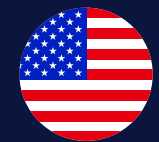
## IMPORTANT

**3.x EOL Notice**

SERVERware 3.x will reach its end of life status Oct 26th.

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to find out more about our services



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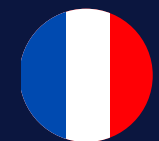
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