

VACUS

DATA CENTER ASSET TRACKING SOLUTIONS

RackSense Management Platform

Version 2.0

Standalone Software for Data Center Asset Management & Physical Tracking

Wired U-Level Tracking • Central Tag Assignment Console • Real-Time Monitoring

PRODUCT DATASHEET

Technical Specification Document

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1. Product Overview

The Vacus RackSense Management Platform v2.0 is a standalone, browser-accessible software suite purpose-built for real-time physical asset management and tracking in enterprise and government data centers. The platform provides a central console for RF-ID tag assignment, Strip/Tag monitoring, and wired U-level location tracking — enabling administrators to know, at any given moment, exactly which asset is mounted at which rack unit and whether that asset is powered on or off.

RackSense is designed to fulfil the documentary, operational and compliance requirements of enterprise and data centre asset tracking deployments, and integrates seamlessly with existing SNMP-based Network Management Systems (NMS) through Vacus' published SNMP interface.

1.1 Key Differentiators

- **Wired U-Level Accuracy:** Precise identification of asset position at individual rack-unit (U) granularity using wired tag strips — no RF-drift, no neighbour-rack confusion.
- **Power-State Awareness:** Detects and reports whether each tracked asset is currently powered on or off, in addition to its physical location.
- **Standalone Deployment:** Fully self-contained on customer-owned infrastructure; no cloud dependency and no external data transit, suitable for secure and air-gapped environments.
- **Central Tag Assignment Console:** Unified web console for bulk and per-asset tag assignment, deregistration, and lifecycle management.
- **3-Year Historical Retention:** All tracking events, occupancy history and alerts retained online for a minimum of three (3) years, supporting typical audit and compliance requirements.
- **SNMP NMS Integration:** Published MIB / OID structure enables third-party NMS platforms to poll asset data without custom adapters.

2. Functional Modules

RackSense Management Platform v2.0 is organised into six (6) functional modules accessible from the main navigation of the web console. Each module addresses a distinct operational requirement for data centre asset tracking.

#	Module	Primary Function
1	Asset Registration	Register, deregister and reassign assets against server entries and tags.
2	Real-Time View	Live rack-wise view of asset count, occupancy, and empty U positions.
3	History	Per-asset movement history and rack occupancy trends over time.
4	Alerts	Live alert console for controller-down, asset-removal and threshold events.
5	System Health	Live operational status of gateways, controllers and tags.
6	Reports	Scheduled and on-demand daily, weekly and monthly reports (PDF/Excel).

2.1 Asset Registration

Central console for tag assignment, deregistration and server mapping

Purpose: The Asset Registration module is the entry point for onboarding new assets into the platform. Administrators can register a physical server or device against a specific RF-ID / strip tag, assign rack and U-location metadata, and deregister assets that have been decommissioned or relocated.

Key Capabilities:

- **Server Registration:** Capture asset identity attributes — serial number, hostname, make, model, ownership and criticality — and bind them to a unique tag MAC ID.
- **Tag Assignment:** Assign one or more RF-ID / strip tags to a registered server; supports individual assignment and bulk import via CSV.

- **Deregistration Workflow:** Controlled deregistration flow with mandatory reason code and operator identity capture for audit trail.
- **Rack & U-Location Binding:** Associate every asset with its intended rack ID and U position at the time of registration.
- **Audit Trail:** Every registration, modification and deregistration action is logged with timestamp, operator ID and before/after values.

2.2 Real-Time Datacenter View

Live occupancy and U-level visibility across every rack

Purpose: The Real-Time View delivers an at-a-glance operational picture of the data centre. Operators see every rack, the number of assets currently detected in each rack, the specific U-positions that are occupied, and the U-positions that remain available for new deployments.

Key Capabilities:

- **Rack-Wise Asset Count:** Live tile for every configured rack showing current asset count, last-seen timestamp, and health indicator.
- **U-Level Occupancy Map:** Visual rack elevation view identifying occupied and empty U-positions with asset identity on hover.
- **Capacity Summary:** Instant view of total Us available versus consumed across floor, row or rack scope.
- **Power-State Indicator:** Each tracked asset shows live power status — powered on / powered off — alongside its physical location.
- **Drill-Down Navigation:** Click-through from any rack tile to the rack's detailed elevation and from any asset to its full history record.
- **Auto-Refresh:** Dashboard refreshes at a configurable interval (default 5 seconds) without requiring manual reload.

2.3 History

Per-asset movement trail and rack occupancy over time

Purpose: The History module provides the audit and forensic backbone of the platform. For any asset, the operator can retrieve the complete chronological record of where it has been mounted. For any rack, occupancy trends can be reviewed across days, weeks or months.

Key Capabilities:

- **Asset Movement Timeline:** Full chronological record of every rack and U-location an asset has occupied, with entry and exit timestamps.
- **Rack Occupancy Trend:** Time-series graph of occupied U-count per rack across user-selected date ranges.
- **Advanced Filtering:** Filter by asset, rack, date range, event type (mount / unmount / power change) or operator.
- **Export to CSV / Excel:** Export any filtered history result set for offline analysis or attachment to audit reports.
- **3-Year Retention:** All history data retained online for a minimum of three (3) years in compliance with audit requirements.

2.4 Alerts

Live alert console for infrastructure and asset events

Purpose: The Alerts module surfaces operationally significant events the moment they occur. Controller failures, unauthorised asset removal, power-state changes and threshold breaches are presented on a live console with acknowledgement workflow.

Key Capabilities:

- **Controller-Down Alert:** Immediate alert when any RF-ID controller or strip loses communication with the gateway.
- **Asset Removal Alert:** Triggered when a registered asset is detached from its assigned rack without an authorised deregistration.
- **Power-State Alert:** Notifies operators when an asset transitions between powered-on and powered-off state.
- **Battery / RSSI Thresholds:** Configurable thresholds for low-battery and weak-signal conditions on active tags.
- **Acknowledgement Workflow:** Operators acknowledge alerts with comments; unacknowledged alerts remain on the active board.
- **Severity Classification:** Four levels — Critical, Major, Minor, Info — with per-role visibility rules.

2.5 System Health

Live status of gateways, controllers and tags

Purpose: The System Health module exposes the operational state of every component in the tracking chain. Administrators can immediately identify the specific component responsible for any gap in visibility.

Key Capabilities:

- **Gateway Status:** Live uptime, IP address, firmware version and last-heartbeat timestamp for every deployed gateway.
- **Controller Status:** Per-controller state (online / offline / degraded), attached-tag count and communication latency.
- **Tag Telemetry:** Aggregate view of total tags, active tags, tags with weak signal, and tags with low battery.
- **Component Inventory:** Searchable inventory of every registered gateway, controller and tag with firmware and hardware details.
- **Health Score:** Composite health score computed from component availability, latency and error rates.

2.6 Reports

Daily, weekly and monthly reports — scheduled or on demand

Purpose: The Reports module produces formal documentation suitable for internal review, compliance submissions and management reviews. Reports can be generated on demand or scheduled for automatic distribution.

Key Capabilities:

- **Daily Reports:** Daily asset movement summary, alert digest, and system availability report.
- **Weekly Reports:** Weekly rack occupancy trend, capacity utilisation and alert incidence summary.
- **Monthly Reports:** Monthly inventory reconciliation, compliance summary and executive dashboard.
- **Custom Date Range:** Any report can be run against an arbitrary date range specified by the operator.

- **Multi-Format Export:** Reports export in PDF (formatted) and Excel (data) formats.
- **Scheduled Delivery:** Scheduled reports can be stored to a configurable server location at defined intervals.

3. Technical Specifications

3.1 Software Architecture

Parameter	Specification
Product Name	RackSense Management Platform
Version	2.0
Architecture	Three-tier web application (Presentation / Application / Data)
Deployment Model	Standalone, on-premise, single-server or clustered
Application Runtime	Python 3.10+ running Flask web framework
Web Server	Production WSGI server (Waitress) fronted by IIS reverse proxy
Database Engine	PostgreSQL 14 or later
Client Access	Web browser on local LAN over HTTPS (TLS 1.2+)
Supported Browsers	Google Chrome, Microsoft Edge, Mozilla Firefox (latest two versions)
Authentication	Local user store with optional LDAP / Active Directory binding
Authorisation	Role-Based Access Control (RBAC) with configurable roles

3.2 Host Platform Requirements

Parameter	Specification
Operating System	Microsoft Windows Server 2019 / 2022 (Standard or Datacenter edition)
Processor (Recommended)	Intel Xeon or equivalent, 8 cores, 2.4 GHz minimum
Memory (Recommended)	16 GB RAM minimum, 32 GB recommended for large deployments
Storage (Application)	100 GB SSD for OS, application and logs

Parameter	Specification
Storage (Database)	500 GB – 2 TB allocated for 3-year data retention (sized per asset count)
Network	1 Gbps LAN interface; dedicated management VLAN recommended
Time Synchronisation	NTP client synchronised to customer-approved time source

3.3 Integration Interfaces

Parameter	Specification
REST API	JSON over HTTPS; token-based authentication; documented OpenAPI specification
SNMP Interface	SNMPv2c with published Vacus enterprise OID tree (base 1.3.6.1.4.54126.1)
Exportable Data	Asset inventory, rack occupancy, alert log, audit log — CSV / Excel / PDF
Syslog Forwarding	RFC 5424 syslog export of alerts and audit events to external SIEM
LDAP / AD Integration	Optional bind to Active Directory for centralised authentication

3.4 Data Retention & Backup

Parameter	Specification
Online Retention	Minimum 3 years for all tracking events, occupancy snapshots and alerts
Audit Log Retention	Minimum 3 years for all operator actions and system events
Backup Mechanism	Native PostgreSQL logical (pg_dump) and physical (pg_basebackup) backups
Backup Schedule	Daily automated logical backup; weekly full physical backup

Parameter	Specification
	(configurable)
Archival	Aged data can be archived to cold storage while remaining queryable

3.5 Security

- **Transport Security:** All browser and API traffic secured with TLS 1.2 or higher; certificates managed on the IIS front-end.
- **Authentication:** Local accounts with strong password policy; optional LDAP / Active Directory integration.
- **Authorisation:** Role-Based Access Control — Administrator, Operator, Auditor and Viewer roles with configurable permissions.
- **Audit Trail:** Every state-changing action is captured in an immutable audit log with operator identity and timestamp.
- **Session Management:** Configurable session timeout, concurrent session limits and secure HTTP-only cookies.
- **Data At Rest:** Database may be deployed on encrypted volumes per customer security policy.
- **No External Dependency:** Fully on-premise; no outbound internet connectivity required for normal operation.

4. Scalability & Performance

Parameter	Supported Capacity
Assets per instance	Up to 50,000 tracked assets per server instance
Racks per instance	Up to 2,000 racks per server instance
Gateways per instance	Up to 200 gateways per server instance
Concurrent users	Up to 100 concurrent browser sessions per

Parameter	Supported Capacity
	server instance
Event ingest rate	Sustained 500 events/sec; peak 2,000 events/sec
Dashboard refresh latency	Typical under 2 seconds on the Real-Time View
History query response	Typical under 3 seconds for a 12-month filtered query

5. Deployment Topology

A typical RackSense deployment consists of the following layers:

Layer	Description
Sensing Layer	Wired U-level tag strips deployed on every rack; each strip reports occupancy and power-state at U granularity.
Controller Layer	RF-ID / strip controllers aggregate readings from tag strips within their rack or row.
Gateway Layer	Data centre gateways collect data from controllers and forward it to the central RackSense server over the LAN.
Application Layer	RackSense Flask application on Windows Server — ingest, business logic, REST API and SNMP agent.
Data Layer	PostgreSQL database hosting asset inventory, live state, historical events and audit log.
Presentation Layer	Operator and administrator browsers on the data centre management LAN.
Integration Layer	Upstream NMS, SIEM and ITSM platforms consuming data via SNMP, REST and Syslog.

5.1 Reference Deployment



6. Licensing & Support

6.1 Licensing Model

- **Per-Instance Licence:** One software licence per deployed server instance, independent of asset count tier chosen.
- **Capacity Tiers:** Licences are available in tiers sized by maximum tracked assets — customer selects the appropriate tier at procurement.
- **Perpetual Licence:** Perpetual use licence for the site-of-use; no recurring subscription required for continued operation.
- **Annual Maintenance:** Optional Annual Maintenance Contract (AMC) covers version upgrades, security patches and technical support.

6.2 Support Services

Parameter	Specification
Standard Support	Business-hours e-mail and telephone support, 9 × 5
Premium Support	24 × 7 support with defined response and resolution SLAs
On-Site Commissioning	Available as a service during initial deployment
Training	Administrator and operator training delivered on-site or remotely
Documentation	Installation guide, administrator manual, operator manual, SNMP integration manual, REST API reference

— *End of Datasheet* —

Vacus RackSense Management Platform v2.0 — Product Datasheet
For commercial or technical enquiries, contact your Vacus representative.