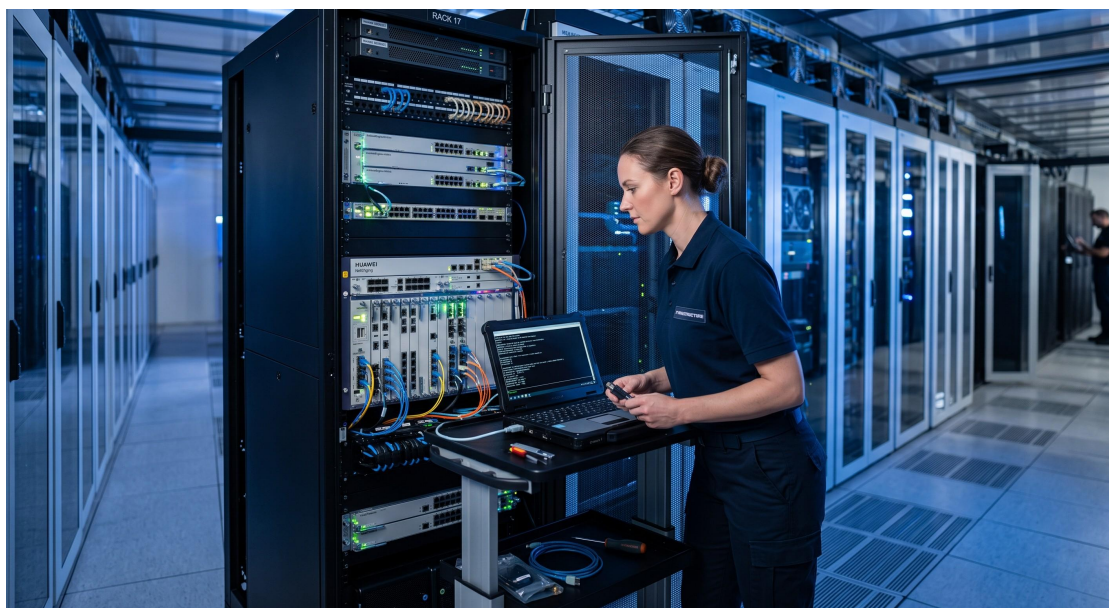


Huawei Router OS (VRP) Upgrade Procedure - Official Technical Overview & Hardware Datasheet

EXECUTIVE SUMMARY

This document provides a comprehensive technical overview of the Huawei Router OS (VRP) Upgrade Procedure, detailing the systematic methodology for transitioning network infrastructure to the latest Versatile Routing Platform (VRP) software releases. Designed for carrier-grade and enterprise environments, this procedure ensures service continuity, enhanced security posture, and access to advanced routing capabilities. The upgrade process is engineered to minimize network disruption through sophisticated hitless and in-service software upgrade (ISSU) mechanisms, supported by comprehensive pre-validation and fallback protocols.



ARCHITECTURE & CHASSIS DESIGN

The VRP upgrade architecture is built upon a modular and resilient framework that supports a wide array of hardware platforms, from compact edge routers to high-density core switching systems. The chassis design philosophy emphasizes high availability, with redundant control planes and forwarding engines that allow for component-level upgrades without affecting data plane operations. The upgrade procedure leverages a staged approach: pre-upgrade health checks, software image distribution via FTP/TFTP or USB, installation validation, and final commit. The system architecture supports dual boot partitions, enabling administrators to activate the new software version and, if necessary, revert to the previous stable version without physical intervention. Key structural elements include:

- Redundant Supervisor Modules with independent CPU and memory resources.
- Backplane architecture that maintains connectivity during control plane switchover.
- Hot-swappable power supply units and fan trays to support maintenance operations.

HARDWARE FEATURES

The upgrade procedure is intrinsically linked to the robust hardware features of Huawei routing platforms, which are designed to support seamless software transitions. Critical hardware components that facilitate the upgrade process include:

- Persistent Storage: Embedded flash memory and optional external USB ports provide redundant storage locations for upgrade images, ensuring file integrity and availability.
- Out-of-Band Management Interfaces: Dedicated management Ethernet ports and serial console connections allow for secure and isolated access during the upgrade, even if the primary data interfaces are disrupted.
- Programmable Hardware Accelerators: NPUs and ASICs are reconfigurable through software updates, enabling performance enhancements and the introduction of new protocol features without hardware replacement.
- Environmental Monitoring: Sensors within the chassis provide real-time temperature, voltage, and fan speed data, which are crucial for verifying system stability before initiating an upgrade.

COMPLIANCE & STANDARDS

The VRP Upgrade Procedure adheres to a comprehensive set of industry

standards and compliance regulations, ensuring interoperability and security.

The procedure is validated against:

- ISO/IEC 27001: Information security management standards for secure software handling.
- ITU-T Y.1731: Standards for network performance monitoring and fault management, ensuring upgrade validation.
- IEEE 802.3: Ethernet standards compliance for uninterrupted data traffic during in-service upgrades.
- ETSI EN 300 386: Electromagnetic compatibility requirements for telecommunications equipment.
- NEBS Level 3: Network Equipment Building Standards for physical and environmental stress tolerance.

The upgrade process incorporates cryptographic verification (MD5/SHA) of software images to guarantee authenticity and prevent unauthorized modifications, aligning with NIST and FIPS guidelines.

TECHNICAL SPECIFICATIONS

Parameter	Specification
Form Factor	1RU / 2RU / 5RU Chassis Options

Switching Capacity	Up to 480 Gbps (depending on platform)
Power Supply	1+1 / 2+2 Redundant AC/DC (100-240V AC, -48V DC)
Software Upgrade Mechanism	ISSU (In-Service Software Upgrade) & Non-Stop Routing (NSR)
Storage Media	2x 16GB eMMC Flash, 1x USB 2.0 Host Port
Control Plane	Dual Redundant Supervisor Modules with 1.5 GHz Quad-Core CPU
Forwarding Capacity	Up to 120 Mpps (64-byte packets)
Operating Temperature	0°C to 45°C (Short-term: -5°C to 55°C)
MTBF (Mean Time Between Failures)	> 350,000 hours
Security Compliance	FIPS 140-2 Level 2, Common Criteria EAL4+
Management Interfaces	1x RJ45 Console, 2x 10/100/1000Base-TX Management Ports

ORDERING OPTIONS

For comprehensive hardware and software procurement, the following ordering SKUs are available to support the VRP upgrade procedure across various deployment scenarios. Each SKU is tailored to specific platform families and licensing models.

- Huawei VRP Base Software License: Includes the core routing stack, IPv4/IPv6, and basic MPLS for enterprise platforms.
- VRP Advanced Feature Set: Adds sophisticated capabilities, including Segment Routing, EVPN, and advanced traffic engineering.
- ISSU Enablement Module: Licenses the hitless upgrade feature for critical, high-availability environments.
- VRP Security Bundle: Incorporates advanced security features, including MACsec and IPsec offload, compliant with FIPS standards.
- Hardware Upgrade Kit: Physical components such as memory modules and storage media for platforms with limited upgrade capacity.
- Global Service Support Contract: Provides 24/7 technical support, software version updates, and access to the Huawei upgrade repository.

