



NovaScale Fault Tolerant servers



Architect of an Open World™



The ultimate level
of robustness for your
Microsoft® Windows®
applications



Service interruption is extremely costly to your business. When a server fails it means financial losses, less productivity and in some cases a significant reduction of the enterprise activity.

Although fault tolerant systems undoubtedly contribute to prevent failures, they have a reputation of being difficult to implement and to be costly; this explains why up to now they have not been popular.

Today, with the NovaScale R600 Series, Bull provides easy-to-implement fault tolerant servers, with no additional costs. Based on industry standards, they benefit from the low prices of industrial components produced in large volume. In addition, they provide the maximum level of reliability to Windows® applications.

Combining the 24/7 fault tolerant technology with standard hardware and software, NovaScale R600 servers provide continuous availability at an affordable price.

The highest level of reliability

NovaScale R600 servers are designed to prevent any failure. Every server consists of two interconnected and redundant subsystems executing the same instructions at the same time.

Should one component fail, the duplicated component acts as an active spare and continues normal operation, thus eliminating downtime, and preventing any data from being lost.

Compact and cost-effective servers

The architecture of the NovaScale R600 servers is based on Intel® processors and standard components, in order to provide cost-effectiveness.

Integrated in one single chassis, NovaScale R600 servers feature a very compact format thus simplifying their installation, and reducing implementation and operational costs.

Constant performance levels

With NovaScale R600 servers processing and switchover operations are executed while maintaining the same performance levels.

Simplified maintenance

Every NovaScale R600 server component is hot swappable, thus guaranteeing business continuity. This is made possible with the NovaScale R600 modular design.

Less than one-hour downtime per year

Continuous availability: beyond high availability

Even the most expensive HA systems provide only 99.9% uptime. By providing continuous availability, Bull NovaScale R600 fault tolerant servers offer more than high availability at a standard server price. Continuous availability guarantees at least 99.999% uptime, i.e. less than one-hour downtime per year (including the time required for updates and maintenance).

Availability	Downtime per year
99%	87 hours, 36 minutes
99.9%	8 hours, 44 minutes
99.99 %	53 minutes
99.999%	5 minutes

Lower cost of ownership

NovaScale R600 fault tolerant servers can be integrated as easily as any other traditional server in an existing infrastructure. This enables the reduction of installation, service and administration costs. In addition, with NovaScale R600 Series, unlike with clustered architectures, only one license is required for Windows and applications.

Every critical hardware component is redundant

NovaScale R600 fault tolerant servers are designed to provide business continuity while offering the same level of performance, independently from hardware problems.

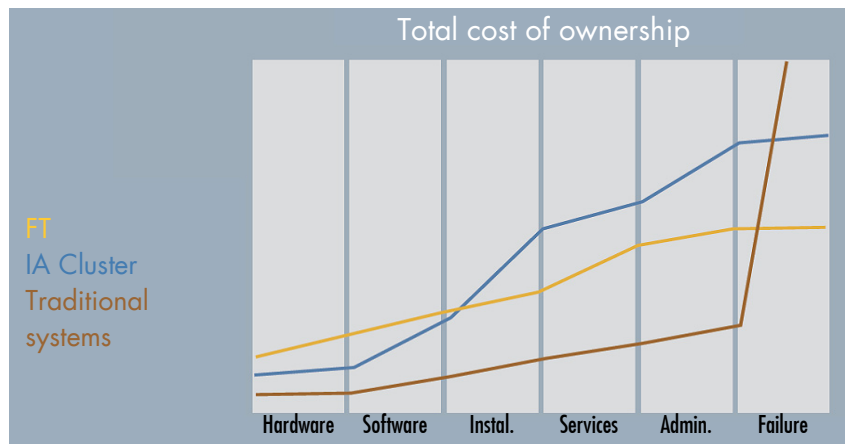
They consist of modular subsystems including redundant components such as: central unit, I/O module, power supply and storage subsystems.

Should one hardware component fail, the redundant component is instantaneously and seamlessly used. The failing component is immediately identified and isolated, without process interruption nor performance reduction, in order to guarantee both the highest level of system availability and data integrity.

A unique technology of failure detection

In a NovaScale R600 system, every redundant central unit executes exactly the same instructions at the same time (lockstep mode). The NovaScale R600 patented failure detection system then compares the output of every transaction of every central unit. When outputs are identical, the detection system operates in pass-through mode.

In case two outputs are different, fault tolerant algorithms identify the failing central unit and interrupt its operation; the output of the other central unit is then used.



24/7 uninterrupted processing, without additional costs

Modular architecture to simplify maintenance

With the modular architecture of NovaScale R600 servers, any module can be replaced without service interruption. In case of failure, Customer Replaceable Units (CRU) can be configured, diagnosed and hot swapped. Lights indicate if hardware components were properly replaced.

Remote management of the system

The NovaScale R600 fault tolerant servers use a management software enabling the remote management and maintenance of the system. The server's redundant components are thus managed in real time over the network.

Hardened drivers and additional diagnosis tools

The NovaScale R600 fault tolerant servers include hardened drivers designed for all system facilities and specific PCI adapters.

The servers are built to prevent operating system failures due to drivers trying to access protected addresses of the physical memory. Hardened drivers are able to detect and prevent memory access beyond the allocated memory.

To do so they are equipped with additional tools providing management and diagnosis functions, operational support in duplex mode and dynamic loading in case of component hot swap.

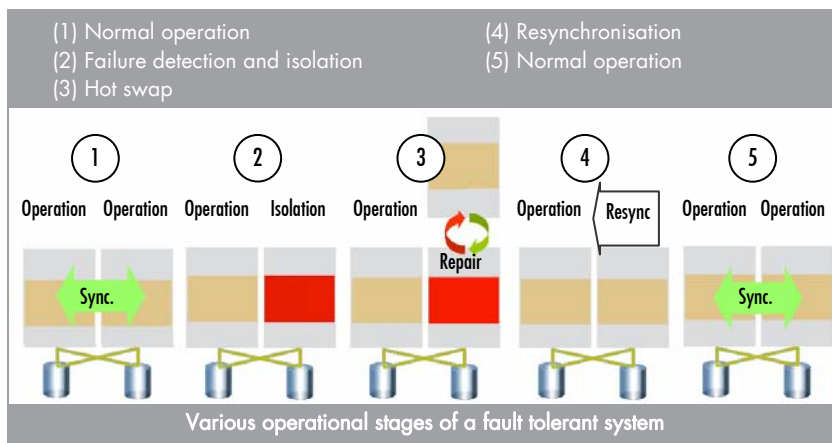
Complete compatibility with Microsoft® Windows®

The NovaScale R600 fault tolerant servers come with Microsoft® Windows® Server 2003 Enterprise Edition preinstalled.

With the Hardware Abstraction Layer (HAL), included in the Microsoft® Windows® Server operating system, fault tolerance is transparent for the system and the applications.

The NovaScale R600 fault tolerant servers are certified by Microsoft hardware certification labs in order to guarantee a complete compatibility with Windows® Server environments.

Windows® applications can be installed and run on fault tolerant servers, with no need to modify the code or create scripts and control files as required in cluster environments.



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