

# Mitigating Risk in Data Centre Relocation

with **Network Emulation**



ACCREDITED PARTNER



## Background

Companies across the world are moving their applications and data servers from centralised servers to remote data centres, consolidating those services and utilising cloud providers to outsource large sections of their IT infrastructure. These strategies offer significant benefits. For example, IT costs are significantly reduced, business continuity and information security are improved, service management is optimised, and government and industry regulations complied with.

## The Challenge

With so many benefits come so many challenges! According to Gartner, "Without proper planning and processes, data centre migrations pose huge financial and operational risks to organisations. Understanding the primary steps required in a migration project is key to identifying what you don't know and what resources will be required to prepare your project for success."

One of the primary factors inhibiting these advantageous projects is the concern over how business critical applications and services will be adversely affected by such moves. Such concerns are legitimate.

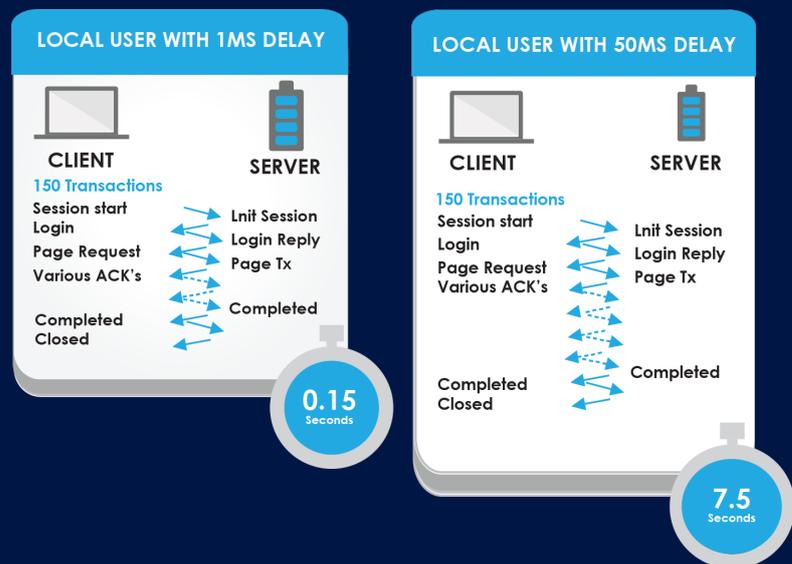
Consolidations and relocations have a huge impact on application performance and service levels in many ways. Users that were previously local to the servers supporting their business applications, for example, may become remote users. Few applications are "future-proofed" against these types of network changes. Varying bandwidth, jittery links, increased latencies and fluctuating service quality must always be considered prior to a data centre migration project.

# Latency and Data Centre Relocation

**Network related delays can change dramatically during data centre relocation, since geographical distance contributes significantly to the network latency between client and server.**

For example the simple doubling of latency (as the server is now physically further away from the user). At face value, this may appear that operations will take twice as long but increased latency also reduces the throughput of applications, further impacting end users.

The relationship between network delay and application response time is far from one-to-one. The following chart provides a relatively simple example of the relationship between network latency and application latency.



For a local user with less than a millisecond of network delay between the client and the server, the transactions completed in 0.15 seconds. When just 50 milliseconds of network delay was introduced (representing a typical cross-country WAN connection), the performance of this transaction did not slow down by only 50 milliseconds. Instead, this same login transaction took 7.5 seconds to complete.

This example dramatically illustrates how small changes in network latency result in major problems with application performance. In a complex project such as a data centre move, the challenge of assessing the network impact on application performance becomes one of large scale as hundreds of servers hosting thousands of applications need to be tested to understand the impact of the data centre move.

## Testing and delivering the Data Centre Relocation

There are many issues that can arise during a data centre move. These issues can threaten business operations and undermine the credibility of IT. Many of these issues cannot be predicted by IT organisations that operate in traditional silos, because they're caused by subtle, complex interactions between networks, servers and applications. In fact, after these issues manifest themselves in the post-move production environment, many IT organisations are left struggling to understand and resolve them. There are a number of options for an organisation involved in data centre relocation - choosing the right option is crucial to the business operations.

### Option one:

#### Perform The Move Immediately

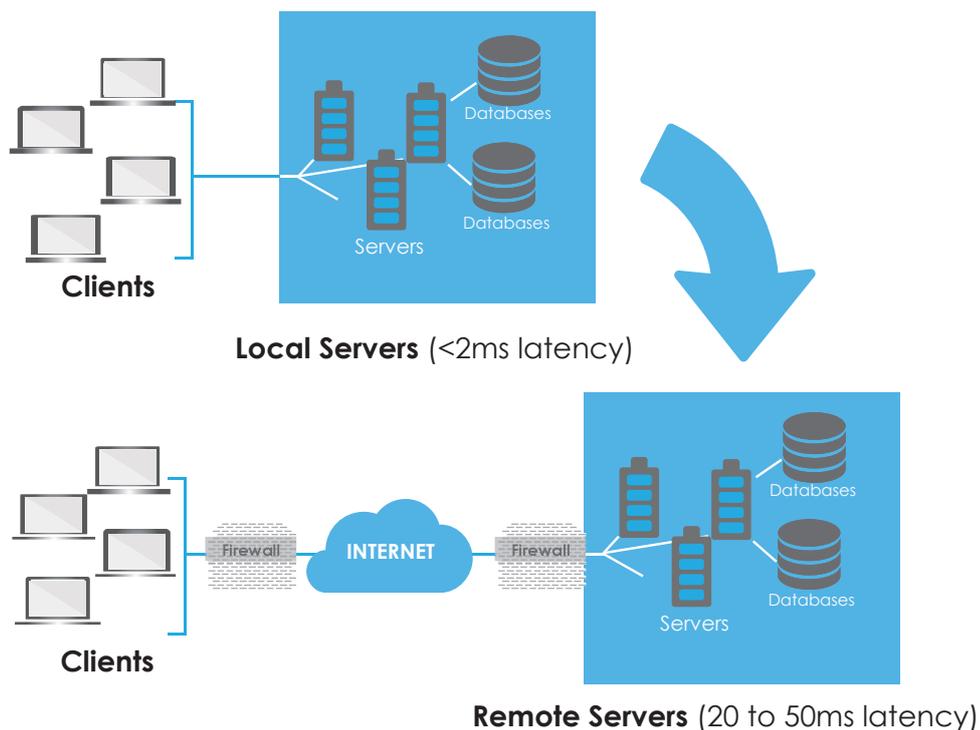
This method involves organisations moving the live systems and their data to the new data centre over a down-time period (such as a weekend). This approach delivers the relocation without any testing and is primarily used when the cost of detailed analysis is prohibitive.

#### Advantages:

- Delivers the relocation immediately.
- Miniscule costs for relocation or testing.

#### Risks:

- Application performance will not be verified until an operation is performed (ie. weekly or monthly tasks).
- Need to manage both local and relocated servers in case a fall back is required.
- Duplication of end users work if fall back is required.
- Extensive hidden costs post deployment from fall backs or application failure.
- Poor end-user experience and tarnishing of professional reputations.
- Failure of SLA's.



## Option Two:

### Lab Testing and Research

In the past, the most popular option has been to perform laboratory testing and research with slow migration of end-users to any newly relocated systems. This approach allows for extensive testing and an acceptable understanding of the expected end-user experience, but is an extremely costly operation.

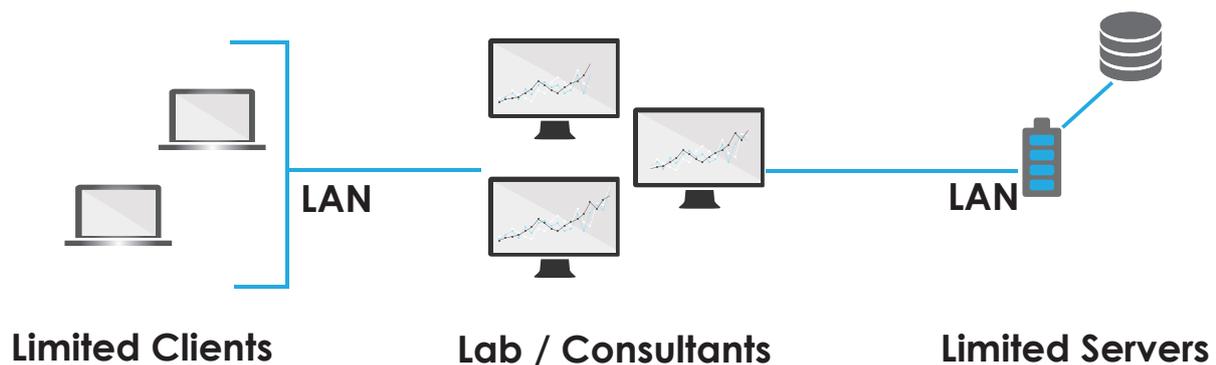
This form of testing requires servers and end-users to be duplicated in a controlled and separate environment from the live systems. Due to the extensive size of most systems only a small number of end-user systems are normally duplicated.

#### Advantages:

- Allows for controlled experimenting with no impact on live systems.
- Small scale evaluation and analysis.
- The report can be used to gauge applications and operations that have greater stress on servers.

#### Risks:

- Expense of servers, clients machines and hiring test equipment.
- Investment in professional expertise and resource.
- Time required to generate detailed information on the application performance.
- Limited scope of testing may result in incomplete risk analysis.



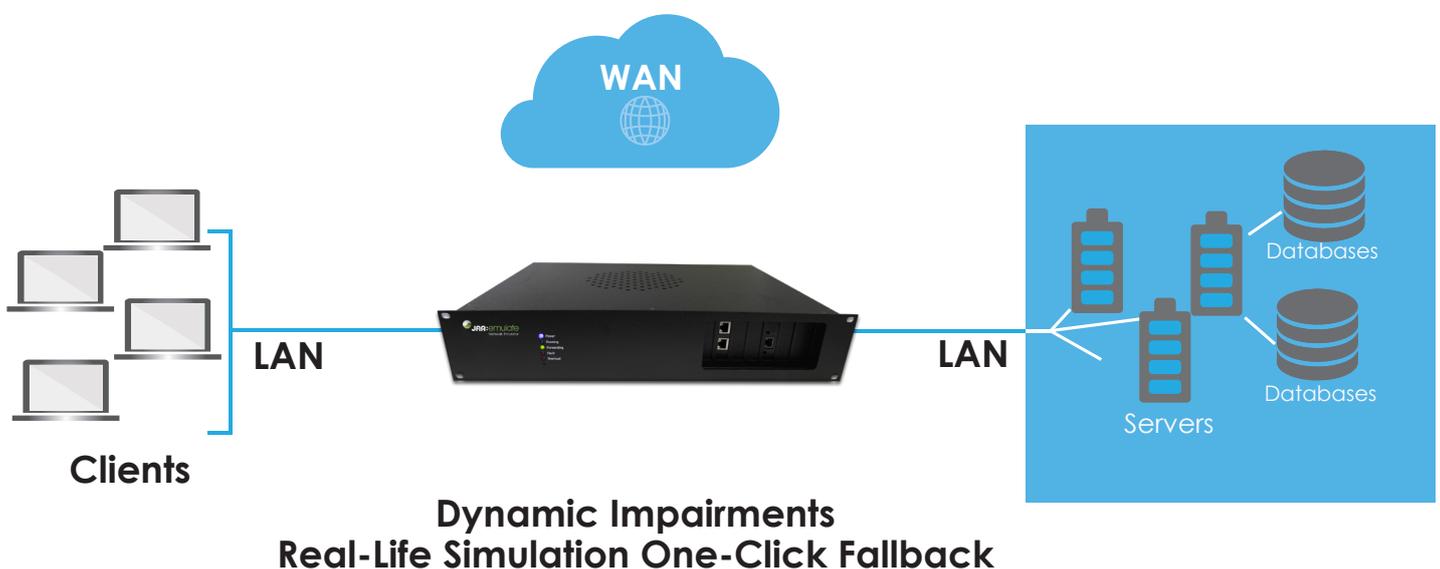
### Option Three:

#### Live Performance Testing with Network Emulation

Live performance testing for a data centre relocation is used by implementing a WAN Emulator between the end-users and the live servers. In its default state, the WAN Emulator acts as a high performance router / switch resulting in zero down-time. The WAN Emulator provides an organisation with the ability to slowly increase the latency and reduce bandwidth over a period of time. Users can actively report their experiences between each change.

- Realistic simulation of the data centre relocation.
- Ability to simulate many different remote sites (with different types of network connections).
- Significantly reduced costs with no external consultants or specialists required.
- Live statistics on network utilisation.
- Built-in reporting that provides information when problems arise, allowing a rapid and cost-effective resolution.
- As this is a live solution you can immediately fall-back to the original unimpaired network with a single click.
- No duplication of end-user during fall-back or post relocation.

By applying proven best practices and appropriate simulation, testing and engineering techniques early in the process, IT organisations can bring predictability to their data centre moves. They can effectively simulate each stage of the move to ensure that the business is properly supported throughout the life of the project. Just as important, this disciplined approach of data centre and server relocation helps **reduce costs, eliminate unexpected delays and optimize user acceptance.**



## How can Network Emulation assist Data Centre Projects?

### Pre-migration:

Our emulators are used in the proof of concept and planning stages by providing 'what if' scenario profiling of application performance from the proposed data centre. Our self-service WAN emulators can introduce latency, jitter, loss and many other network impairments found following a server or data centre relocation. Application performance issues can be identified and mitigated early and SLA's met once the data centre is operational.

### On-going Data Centre Maintenance:

As companies develop and / or deploy new and updated business critical applications, it is vital for data centre stakeholders to understand exactly how these new software modules will react across the end-to-end network (from data centre to end user and back again). WAN acceleration technology will not solve the issue of poor application performance if the issue is not simply related to low available bandwidth, as fundamental issues with application code will not be resolved by sending the data faster. Trailing new or updated application traffic on production servers can quickly lead to interference with other live applications and the network conditions experienced at any one time may be significantly different later the same day, week or month. Our WAN emulation solutions allow customers to test under the network conditions their applications will be expected to perform on and determine if, how and why applications will or will not perform when hosted from the data centre.

## JAR:Emulate series of Network Emulators enables you to:

### Reduce costs:

Identifying and eliminating application /system performance issues early in the development lifecycle results in significant cost savings. These are primarily achieved through a dramatic reduction in the level of remedial work required later.

### Reduce time to market:

Identifying and fixing application performance issues early in the development lifecycle will prevent release delays to users and customers.

### Maintain reputations and retain customers:

Companies who are unaware of how their applications/systems will perform when released on the WAN are prone to a measurably higher level of product recall and re-work in the field.

### Ensure service level targets are met:

Know with certainty that your application or system will perform as required when released onto a WAN, and service level targets will be met.





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