



net-runna

Enterprise

technical

white paper

net-runna Enterprise - enhancing system lifecycle management



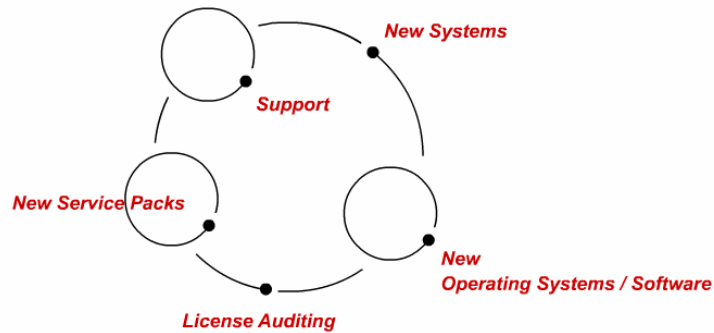
Introduction

net-runna is designed to provide rapid imaging, deployment, compliance and recovery capabilities for all IT environments. The technology is designed for the static and mobile work force and assists IT projects at various stages. *net-runna* is the fastest and easiest to use software continuity solution available. This paper explains *net-runna* as a technology and how it fits into the IT lifecycle.

The key benefits gained from applying *net-runna* to your IT projects are:

- Deployment Speed: Up to 80% faster than traditional technology, assisted by disk caching
- File Based Imaging
- Image Storage: Requires Minimal Disk Space due to Single Instance File Storage
- High Speed Image Creation: Up to 80% faster than traditional technology, due to intelligent file based imaging
- Rapid Multicast Deployment
- Dramatically Reduced Network Traffic (Disk cache only downloads differences)
- Cross Platform Capability: Microsoft and Linux (FATx, NTFSx, EXTx File Systems)
- Distributed Management
- Database or LDAP Data Configuration Storage
- Self Heal: Assisted by the disk cache, clients are capable of auto-repair in seconds
- Event Logging
- Asset Auditing
- Software License Audit

System lifecycle phases



To achieve a lower cost of ownership companies are exploring various new technologies. These include thin client, terminal services, web integration and open source. All of these offer significant benefits and at the same time disadvantages.

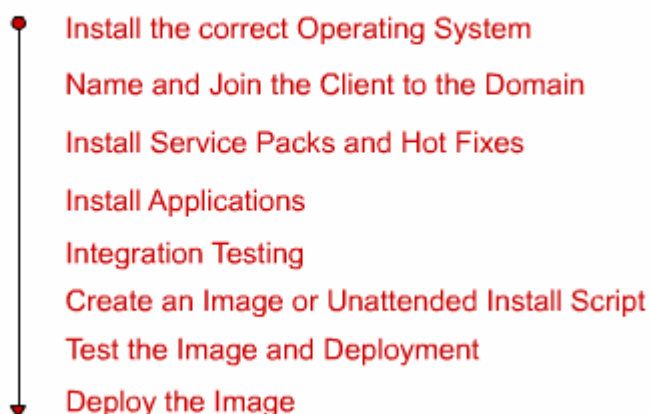
net-runna aims to assist and provide added benefit to these technologies. The diagram above shows the various phases the IT process involves. *net-runna* provides savings of both time and cost to all of these phases.

Phase 1 – New systems

New systems require deployment – this could include new computers or existing computers requiring new operating systems or applications.

The following explains the process in general steps and outlines the tasks involved in commissioning a system.

New Systems



This process is time consuming and in most cases repetitive. The traditional tools used to assist in this process are antiquated and are not designed to deal with the large amounts of data involved.

net-runna provides fundamental enhancements to revolutionise this process.

net-runna applies fast imaging tools, thus vastly decreasing the amount of time necessary to build and test the initial configurations. Once the basic image has been created and tested on one machine it can be deployed to the rest of the machines using multicast deployment.

In the case of migration a snapshot of every machine can be taken prior to deployment. Should there be any problem with the deployed image the machine can roll back to its original configuration with no loss of data - in minutes.

Unlike other deployment and imaging products *net-runna* continues to add value with the fastest and most reliable recovery framework for your entire IT infrastructure. Should an operating system or application failure occur during the system lifecycle *net-runna* can perform rapid repairs and recovery.

Fundamental enhancements

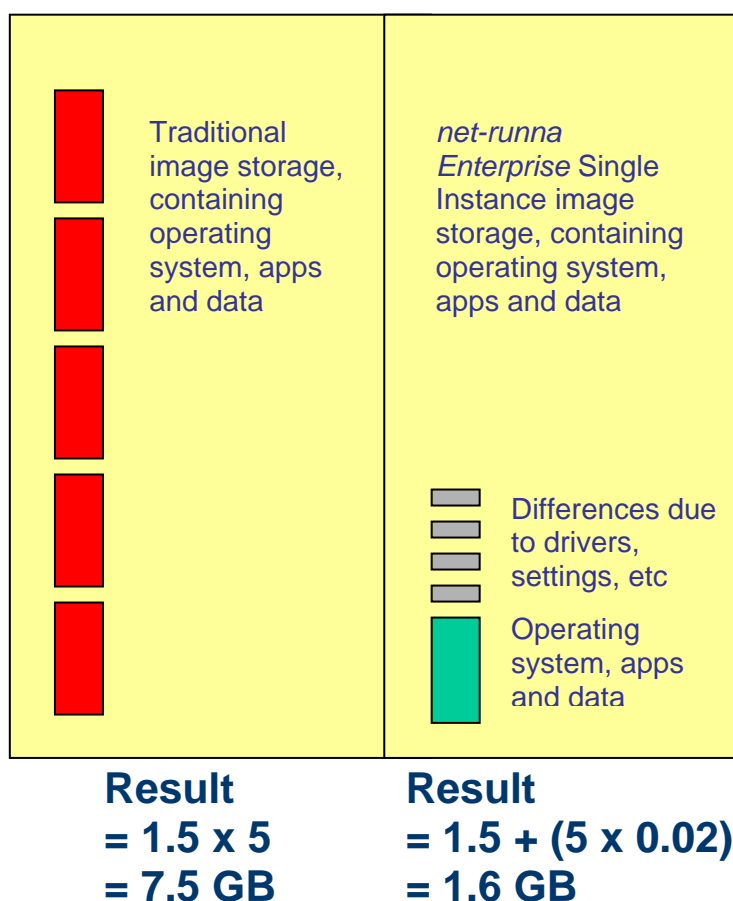
Reduced storage requirements

File Based Imaging – Single Instance Storage (SIS) Repository

Existing imaging technology takes too long and occupies too much disk space to make it viable during the initial creation of the system configuration.

Using file based imaging *net-runna* is capable of creating full system images in minutes. Because most of the data involved at this stage is common, the single instance repository would already contain these files and therefore not copy them again. This makes it possible to backup and restore full system images at any stage giving multiple rollback points to perform recovery from any error. Snapshots of every machine on the network can be taken prior to migration or patching, should any machines fail they can be restored to their original working configuration in minutes.

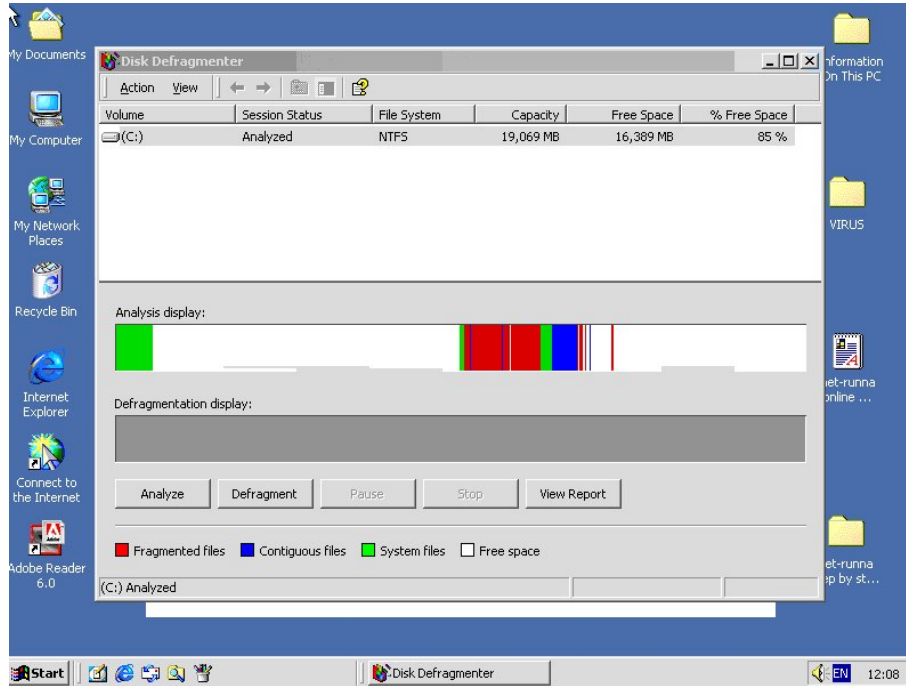
Example of 5 system images



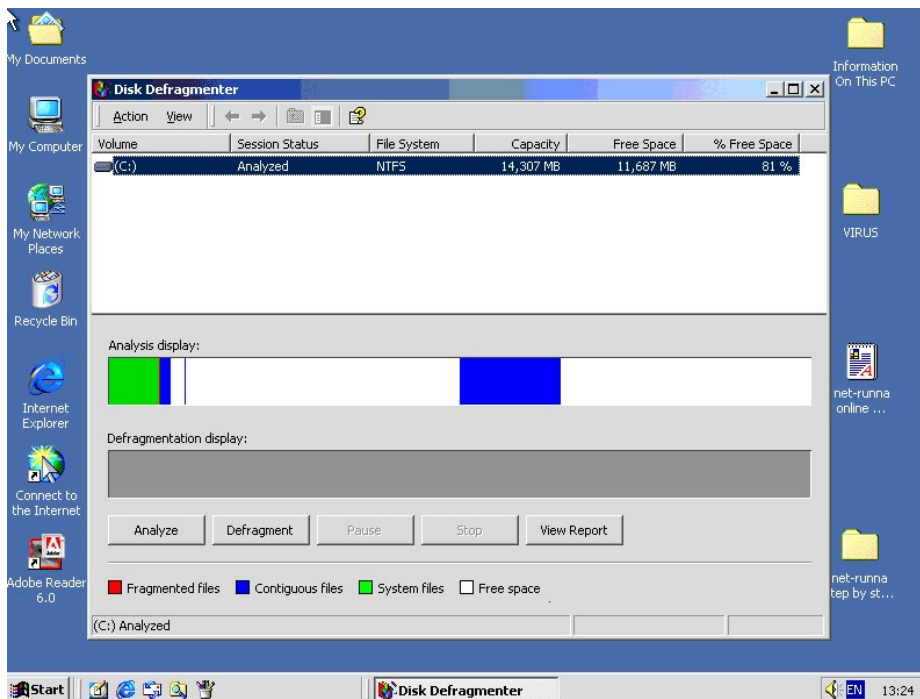
Automatic disk drive defragmentation

Due to *net-runna*'s file based imaging when images are deployed the hard disk is automatically defragmented.

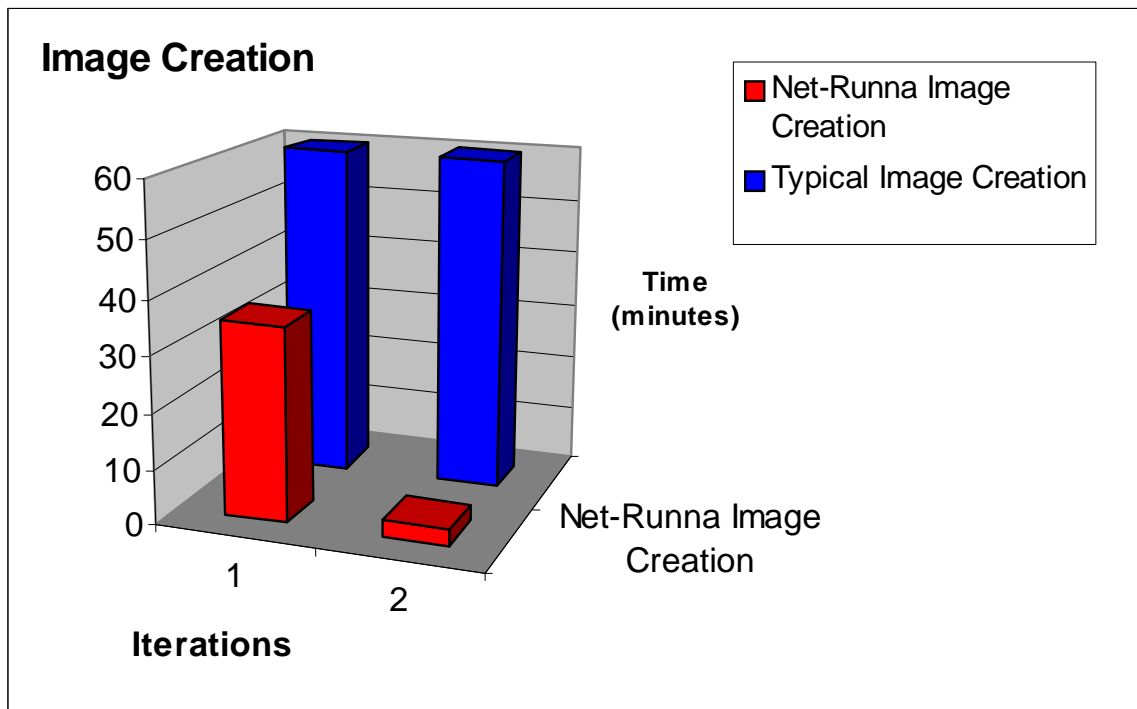
Windows 2000 following a clean installation



Windows 2000 installation following *net-runna* imaging and deployment



A comparison between *net-runna* and traditional imaging tools imaging time.



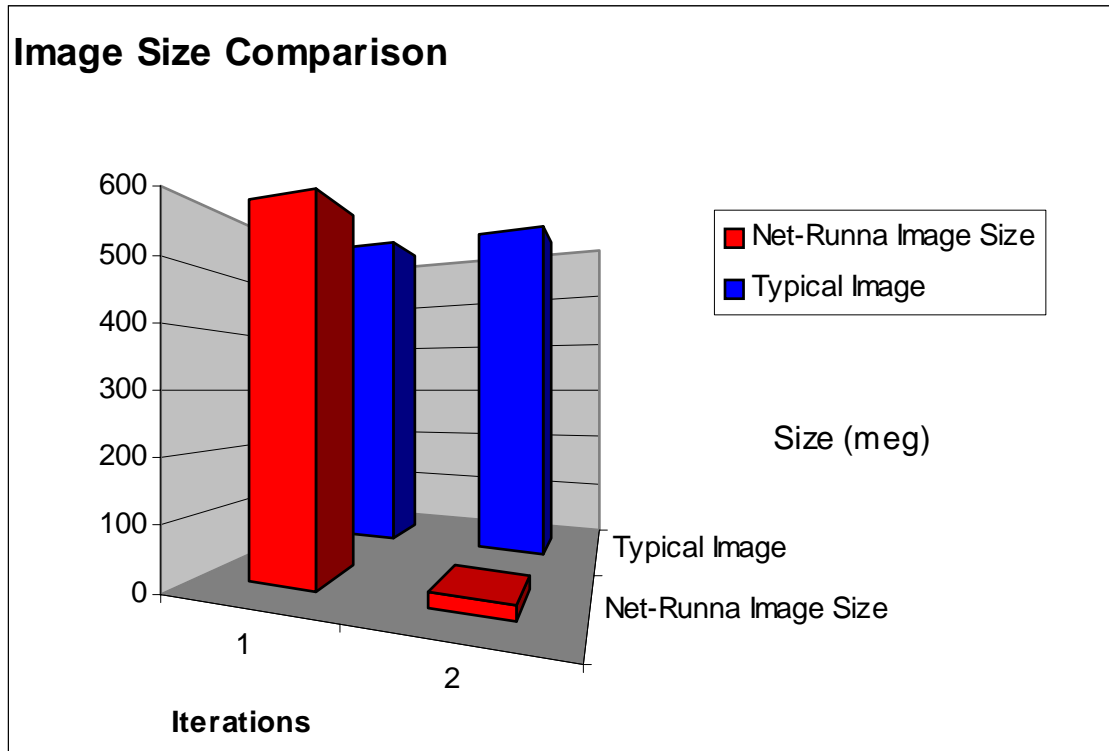
First iteration

The first time an operating system is imaged the single instance repository is populated with all the files for that operating system type.

Second iteration

Subsequently when *net-runna* images computers running the same operating system only the file differences are copied. The common files between the 2 images are only stored once. This reduces the amount of data being copied across the network which speeds up imaging and cuts down on network utilisation.

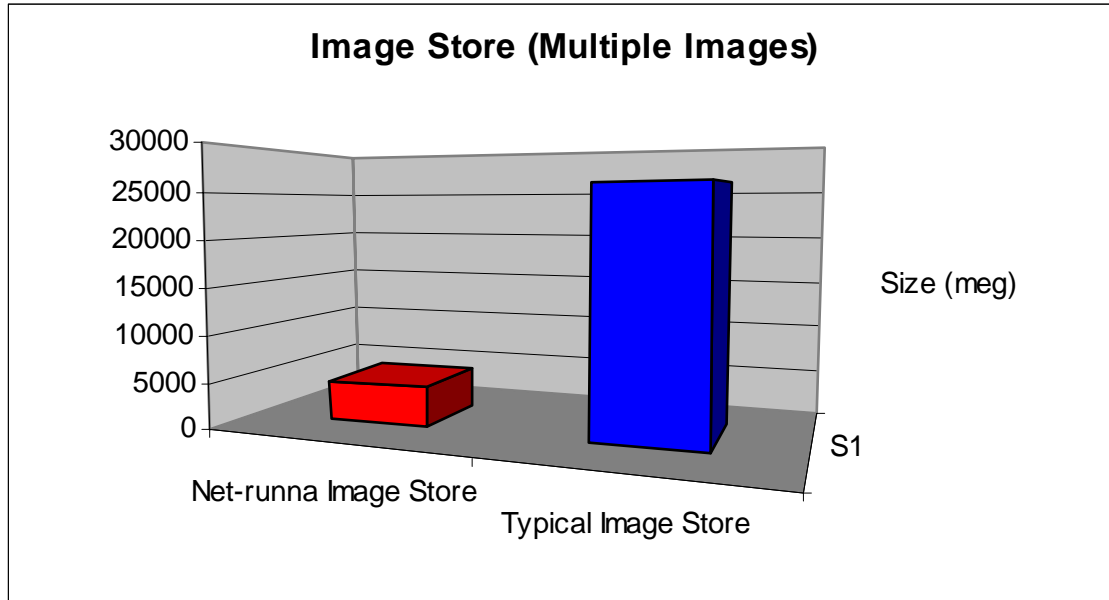
net-runna single instance image storage (SIS) efficiency



SIS operation

Similar operating systems, for example Microsoft Windows XP and Windows 2000 have common files. Once *net-runna* has taken an image from a Windows 2000 machine and a Windows XP machine the image repository on the *net-runna* server is populated with both sets of files. The image repository will only grow in size with the small differences from each subsequent image taken.

Multiple image types storage requirement



Example: Fail safe migration of 1000 machines from Windows 2000 to Windows XP:

An image of each Windows 2000 machine can be taken in its current working state, including all the users' settings. This snapshot can be used to roll back the machine in approximately 15 min should the migration fail:

1000 Windows 2000 SP4 images:

Traditional imaging - approximate storage requirement: **1500 GB**

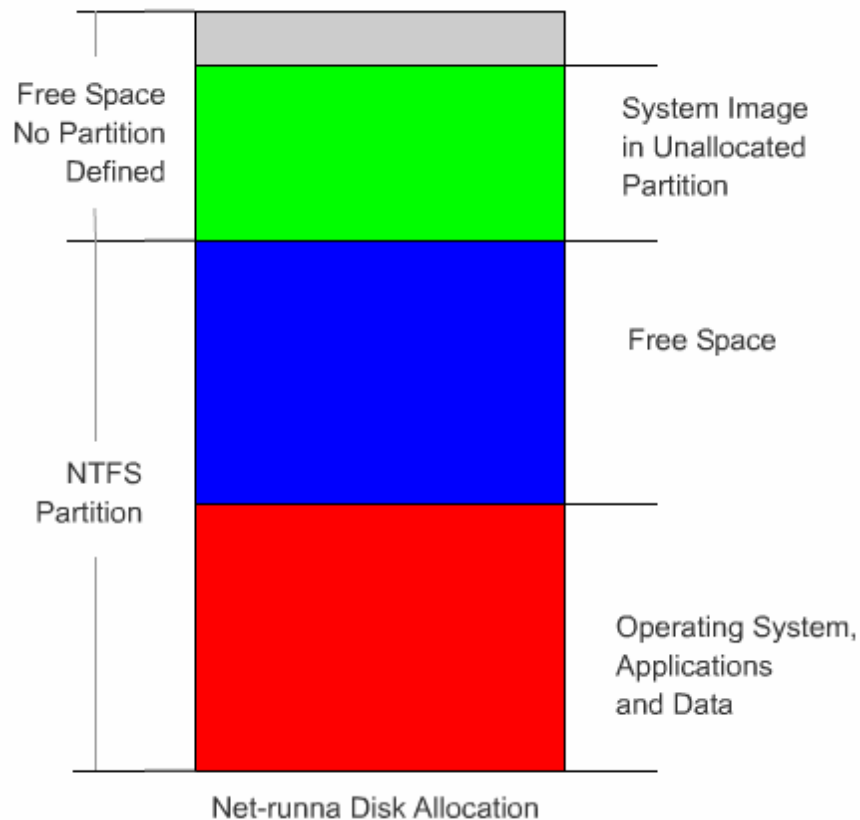
net-runna imaging - approximate storage requirement: **30 GB**

Reduced network traffic

Image caching

Image caching in conjunction with the single instance file storage creates an environment where network traffic only occurs when updating differences, not the entire image. The image cache is effectively a section of the hard disk that is unallocated and contains all the files necessary to build the system to the given configuration level.

The image cache works as a mirror of the server file store. If updates are made to the image the *net-runna* server replicates the updates to the clients via a multicast protocol.



The image above shows the different elements of a disk following a *net-runna* deployment. The red section is operating system files, application files and user data. The blue section is free or available disk space. The green and grey sections are unallocated disk space, used for caching the systems image data.

Image file transfer

The diagram below illustrates how the initial image is transferred to the client and then shows that only the changes, which have been made, are saved to the server. The blue traffic shows how little data is transferred when creating a complete system backup, only the differences are transferred. This same procedure is always employed when creating system images; only files that differ from those already in the repository are uploaded or downloaded.

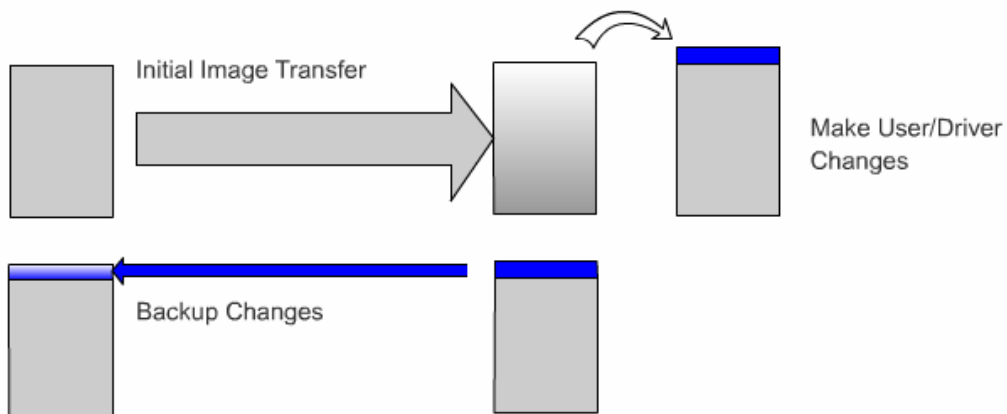
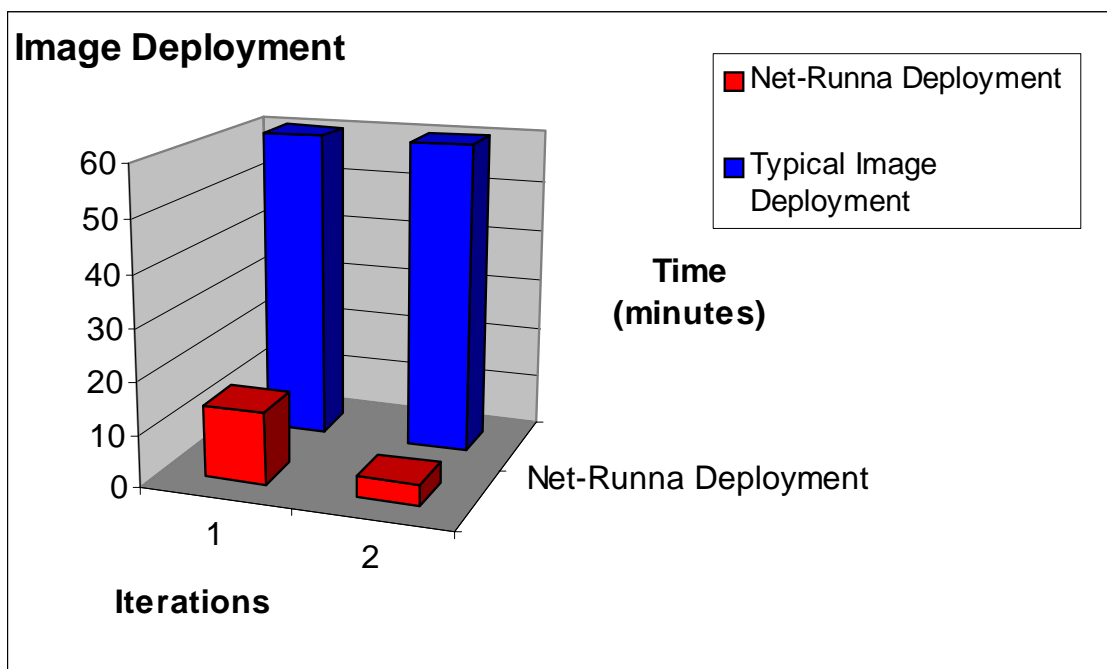


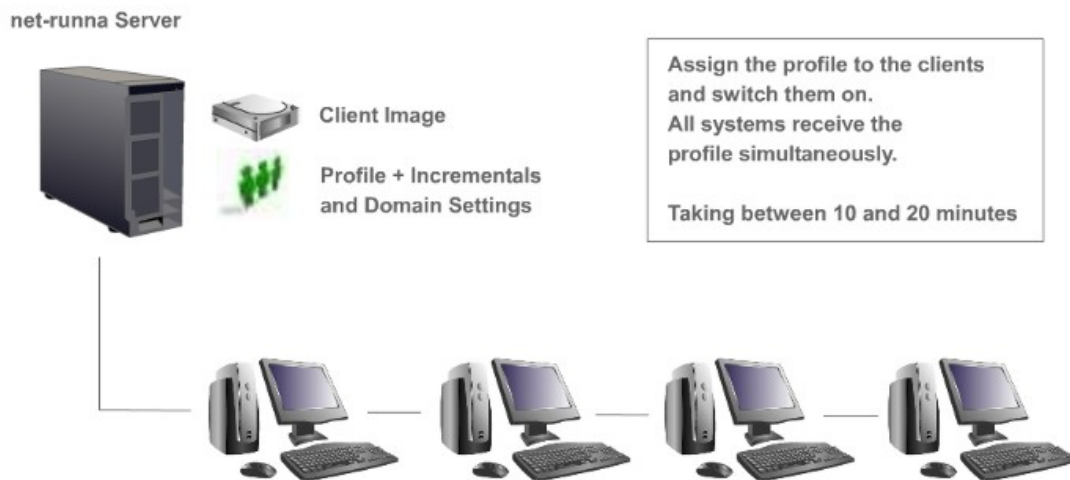
Image deployment

The graph below shows the enhancements provided using file based imaging in conjunction with the disk cache. The disk cache only updates the differences and hence reduces network traffic dramatically.



Multicast deployment

net-runna uses multicast deployment, which allows multiple clients to participate in a single download session. Data is sent to multiple clients simultaneously; deployment is fast and uses less network bandwidth than conventional unicast deployment.



Phase 2 - License auditing

During a deployment exercise it becomes increasingly difficult to maintain accurate licensing information. Each *net-runna* client automatically performs a software audit and stores the information as a scheduled or event driven basis (e.g. during client boot). This provides administrators with live, accurate licensing details at all times.

Administrators are able to draw reports for individual clients, groups of clients (departments) and the entire enterprise. This information can then assist with licensing and compliance procedures.

The licensing information is stored in an SQL database and can, at any time, be exported for use within other 3rd party applications.

Phase 3 – Service packs and software deployment

Incremental imaging

This uses the same single instance repository and disk cache to achieve low network utilisation and low disk space requirement. An Incremental image can be made of software, drivers, patches or any software/application. It is a difference between a base image and an installed system. The process used to create an incremental image is as follows:

- Deploy a base image to a system.
- Install the software.
- Re-boot and create the incremental in the *net-runna* console.
- Save this in the repository for later deployment.

net-runna employs a group policy structure for deploying grouped systems with similar configurations. Incremental images allow the creation of profiles containing base images and incrementals, domain information and other deployment related information. These profiles are then used to deploy clients as pre-determined by the administrator.

Phase 4 – Support

Disaster recovery

net-runna is capable of storing a complete image of each system's current configuration without requiring vast amounts of disk space. Multiple images of a system can be held by the *net-runna* server, which allows for rapid deployment to multiple rollback points. Images are easily stored off site or replicated to a backup server in a different location. This provides a site-wide recovery capability to individuals or all clients in a matter of minutes.

Bare metal delivery

net-runna is built on Rembo and PXE based technology allowing it to commission computers without operating systems. This means that entirely new systems are deployed and configured to work in a new environment in minutes. *net-runna* works 'out of the box' and enables rapid zero touch deployment to bare metal machines; no client agent or client setup is required.

Self repair

This uses the disk cache (holding the system image) to automatically repair systems with missing or corrupt operating system or application files. On every reboot *net-runna* identifies and replaces any missing and damaged files, this process usually adds 10-15 seconds to the boot process. Clients would typically be configured to store their user data on a file server; *net-runna* will take care of the system files. *net-runna* enables access to manage and repair your computers even when the system won't boot due to a damaged application or operating system.

Repair options

Administrator triggered repair

The computer is deployed and left to run. Snapshot images of the computer can be made at any time. Should the system get into a non working state the administrator can initiate a repair or re deploy one of the images back to the computer.

Repair all

On every reboot *net-runna* replaces faulty or changed files or applications and disables unauthorised software installations. Filters to the repair process can be set e.g. ignore documents and settings. This will allow some local user configuration and retain settings such as Internet explorer favourites and the desktop background.

Always replace

On every reboot this formats the disk and re deploys the image, this completely removes unauthorised software and virus corruption.

Offline self repair

On every reboot the computer self repairs from the cached image on its hard drive. If the cache partition is deleted or the disk is replaced the computer would automatically rebuild to its predetermined settings the next time it connects to the network and can access the *net-runna* server.

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