

**PATENTS ACT 1977**

APPLICANT                                EMC Corporation

ISSUE                                        Whether patent application numbers  
   GB0505403.6, GB0600143.2 and  
   GB0600140.8 comply with sections 1 and 14

HEARING OFFICER                        H Jones

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**DECISION**

**Introduction**

- 1 International patent application number PCT/US2003/023998 was filed in the name of EMC Corporation on 14<sup>th</sup> August 2002, claiming priority from an earlier US patent application filed on 30<sup>th</sup> October 2002. The international application was published by WIPO as WO 2004/042565 A2 on 21<sup>st</sup> May 2004 and entered the UK national phase as GB0505403.6 ("the parent application") on 31<sup>st</sup> July 2003. Divisional applications GB0600143.2 ("D1") and GB0600140.8 ("D2") were subsequently filed on 5<sup>th</sup> January 2006 and published respectively as GB2419444 and GB2419443 on 26<sup>th</sup> April 2006.
- 2 The examiner has maintained throughout his examination of all three applications that the inventions claimed are excluded from patentability as programs for a computer under section 1(2) of the Patents Act 1977 ("the Act"). Various other objections were made regarding the lack of inventive step in certain claims of the parent application (section 1(1)(b) of the Act), and the lack of clarity and adequate support in respect of certain claims of the divisional application D2 (sections 14(5)(b) and (c) of the Act). The applicant failed to overcome these objections and requested to be heard in the matter.
- 3 The matter came before me to decide at a hearing on 16<sup>th</sup> May 2007. Mr Alan Bryson, instructed by Ms Virginia Driver of Page, White Farrer, attended as counsel for the applicant, and very helpfully submitted a skeleton argument beforehand.

**The inventions**

- 4 The inventions relate to the provisioning of resources in a computer system by way of automatic set-up and user modification of the storage requirements and networking configurations associated with one or a number of host computers. The applications suggest that resource selection and configuration of computer systems can be a complex and labour-intensive exercise, involving a myriad of mapping operations and port assignments matched to the requirements of the computer system and the hardware resources available.

- 5 The applications are directed to techniques for automating the provisioning of a computer system that allow a system engineer to modify certain parameters relatively quickly by way of a computer interface. The parent application relates to the creation of a provisioning request that defines the preferred host computer, storage system and networking arrangements, and then the automatic configuration of the system in such a way that it satisfies the provisioning request. Divisional application D1 relates to a so-called "reverse engineering" option, which determines the configuration of an existing system and presents configuration information to the user for manual modification before automatically configuring the system in the manner disclosed in the parent. Finally, divisional application D2 relates to a so-called "undo" option, which creates a series of undo operations and assignments to rollback the system to an earlier working configuration if an unintended result is detected.
- 6 The parent application has two independent claims (claims 1 and 18), which are annexed to this decision at Annex 1. An amended set of claims incorporating the limitation of claims 2 and 19 into independent claims 1 and 18 respectively was submitted for discussion at the hearing - claims 2 and 19 are also listed at Annex 1.
- 7 Divisional application D1 has one independent claim (claim 1) and, as was the case with the parent application, an amended set of claims was submitted for discussion at the hearing. Due to the fact that little opportunity was given to fully consider these claims prior to the hearing, it was agreed that the examiner would, if necessary, issue a further examination report dealing with any clarity and support issues after the hearing, and that the applicant would be given an opportunity to file written submissions in response to the report before a decision was issued. In the event, Ms Driver filed a further set of amended claims in response to the examiner's report with the aim of clarifying the nature of the invention - Annex 2 lists all three versions of claim 1, i.e. the one on file immediately before the hearing (claim 1), the one submitted for discussion at the hearing (claim 1a) and the amended claim filed after the hearing (claim 1b).
- 8 Divisional application D2 has one independent claim (claim 1), which is annexed to this decision at annex 3 together with an amended form of claim 1 (claim 1a) submitted for discussion at the hearing.

### **The law**

- 9 The relevant provisions of sections 1 and 14 are:

*1(1) A patent may be granted only for an invention in respect of which the following conditions are satisfied, that is to say -*

*(a) ....*

*(b) it involves an inventive step*

*(c) ....*

*(d) the grant of a patent for it is not excluded by subsections (2) and (3) below*

*1(2) It is hereby declared that the following (among other things) are not inventions for the purposes of this Act, that is to say, anything which consists of -*

*(a) ....*

*(b) ....*

*(c) a scheme, rule or method for performing a mental act, playing a game or doing business, or a program for a computer;*

*(d) ....*

*but the foregoing provision shall prevent anything from being treated as an invention for the purpose of this Act only to the extent that a patent or application for a patent relates to that thing as such.*

- 14(5) *The claim or claims shall -*  
(a) ....  
(b) *be clear and concise;*  
(c) *be supported by the description;*

### **Interpretation**

- 10 The correct approach to assessing patentability under section 1(2) is set out in the Court of Appeal's judgment in *Aerotel/Macrossan*<sup>1</sup>, and comprises a four step test as follows:
- 1) properly construe the claim
  - 2) identify the actual contribution
  - 3) ask whether the actual contribution falls solely within the excluded subject matter
  - 4) check whether the contribution is actually technical in nature

- 11 Paragraphs 46 and 47 of the Court of Appeal's judgment provide further guidance regarding the fourth step of the test:

*"46. The fourth step - check whether the contribution is "technical" - may not be necessary because the third step should have covered that. It is a necessary check however if one is to follow Merrill Lynch as we must.*

*47. As we have said this test is a re-formulation of the approach adopted by this court in Fujitsu: it asks the same questions but in a different order. Fujitsu asks first whether there is a technical contribution (which involves two questions: what is the contribution? is it technical?) and then added the rider that a contribution which consists solely of excluded matter will not count as a technical contribution."*

- 12 Mr Bryson agreed that this was the correct approach to follow in deciding whether the present inventions relate to excluded matter.

### **Arguments and analysis**

- 13 Since the issue of whether the inventions are excluded from patentability as programs for a computer is common to all three applications, I shall deal with this issue first.

#### Excluded matter

##### i) the parent

- 14 The first step I must take is to properly construe the claims, or as the Court of Appeal put it "to decide what the monopoly is before going on [to] the question of whether it is excluded." In his skeleton argument, Mr Bryson says that there is no particular difficulty regarding the construction of claim 1, and I agree. I can therefore proceed immediately to consider the second step.

- 15 The second step is to identify the actual contribution, which the Court of Appeal rightly recognised is more problematical as it involves an exercise of judgment "probably involving the problem said to be solved, how the invention works, what its advantages are." The Court also said that the formulation of the contribution involves looking at the substance of the invention and not the form.

- 16 In his skeleton argument, Mr Bryson says that the problem to be solved in this case is

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<sup>1</sup> *Aerotel Ltd vs Telco Holdings Ltd & Macrossan's Patent Application* [2007] RPC 7

how to set about provisioning a computer system in the most flexible way and overcoming the complex and labour-intensive exercise typically involved. He says that this is achieved by the claimed method involving substantial automation of the exercise, the specification of a desired configuration having first been provided. The advantages are facilitation of the exercise in the most flexible way, labour-saving and no-doubt, avoidance of errors that may occur in a non-automated exercise. He says that the contribution can be seen as a method of provisioning a computer system that has such advantages.

- 17 Having compared the method defined by claim 1 with the prior art, the examiner arrives at a similar assessment of the contribution made by the claimed invention, although formulated in the slightly narrower terms of a computer program, i.e. he considers the method of provisioning a computer system to be in substance nothing more than a computer program. Mr Bryson addressed this issue of substance over form by saying that while the automation aspect of the claimed method may no doubt be achieved by a computer program, the contribution lies in more than just a new program, since the claimed method may be said to provide a solution to a technical problem within the computer system (or, possibly, represents a technical process outside the computer system in that the computer system could be said not to exist until provisioned).
- 18 As I understand it, Mr Bryson's concern at such a narrow formulation is that once defined in terms of a computer program, the inevitable conclusion of the third step must be a finding that the contribution cannot extend beyond being a computer program as such and that it must be excluded. I do not share Mr Bryson's concern - as he rightly said in referring to the analysis of case law at paragraphs 83, 91 and 92 of *Aerotel/Macrossan*, the courts have clearly found that an invention to a computer program making a technical contribution should be patentable, and so the answer to step three cannot be a foregone conclusion.
- 19 The identification of the actual contribution ought to be a matter of fact to be determined in the light of the applicant's disclosure and the prior art. From my reading of the application, I am left in no doubt that the method involved in provisioning the computer system is indeed a computer program, and therefore agree with the examiner's assessment of the actual contribution made, i.e. it is a computer program that allows a user to specify the particular configuration of a computer system, which then automatically configures whatever hardware resources are available based upon the user's specification. I note from the application that the step of configuring individual hardware resources in a computer system in the manner intended by the applicant's invention is extremely well known, and the fact that each resource has to be configured individually is what makes the process such an error-prone and labour-intensive exercise. In this context, the contribution can be seen to be a computer program that provides automatic configuration of a number of individual hardware resources required for a particular arrangement of computer system. As I have already mentioned above, the fact that the contribution is defined in terms of a computer program does not in any way pre-judge the question of whether the invention is (or is not) patentable.
- 20 The third step is to ask whether this contribution falls solely within excluded matter, and in this particular case to whether the contribution is solely a program for a computer. In his skeleton argument, Mr Bryson addresses this question from the point of view of a technical solution provided to a technical problem. However, the question of whether the contribution is technical in nature is not a matter I need to address until I get to the fourth step of the *Aerotel/Macrossan* test. In other words, what I must decide at this point is whether the contribution is solely a program for a computer.
- 21 In its broadest sense, the contribution can be seen to be a set of instructions allowing a

computer to capture information from the user, to compare that information with a record of the hardware resources available, to determine the necessary configuration settings and to configure the resources accordingly. The instructions allow for data to be captured and for certain hardware settings to be modified based upon a comparison of the data with stored information. I can find nothing new in the functionality of these instructions (i.e. they merely perform standard data processing operations), but collectively they allow the manual and labour-intensive task of configuring a computer system to be performed automatically and with potentially fewer errors. The use of standard data processing instructions to replicate a known process clearly points to a contribution being made solely within the meaning of a program for a computer as set out in section 1(2)(c).

- 22 Having decided that the contribution relates solely to excluded matter, it is not then necessary for me to proceed to the fourth step of considering whether or not the contribution is technical in nature. I conclude therefore that the invention defined by claim 1 is excluded from patentability as a program for a computer. I am reinforced in this view by the Court of Appeal's earlier finding in *Fujitsu*<sup>2</sup> that said that mere avoidance of labour or error by the use of a computer program does not provide a technical contribution.
- 23 Claim 18 is defined in terms of a computer system comprising a processor programmed to configure certain resources according to a user specification. The contribution is exactly the same as that made by the invention defined by claim 1, and so I find that it too relates to excluded matter. Claims 2 and 19 both add the requirement that the computer system be configured to provide a mirrored storage facility. This mirroring arrangement is entirely conventional and therefore cannot extend the contribution beyond the limits of a program for a computer. I have reviewed the remainder of the claims and also the application as filed and have been unable to find anything that extends the contribution beyond the limits of a program for a computer.

ii) divisional D1

- 24 There was some debate at the hearing regarding the construction of claim 1 of divisional application D1 and, in particular, whether the step of modifying the specification of the computer system could properly be regarded as a computer program. Mr Bryson's argument was that the examiner had been mistaken in defining the contribution in terms of a computer program because the description clearly specified that the modification step could be done manually by a user. Mr Bryson argued that had the examiner properly construed the meaning of "modifying" in claim 1, he would not then have defined the contribution in terms of a computer program and the objection under section 1(2) would have fallen away.
- 25 I agree entirely with Mr Bryson's construction of the term "modifying" in claim 1, but do not consider that this materially affects the nature of the contribution in the way that he suggests. The difference between the invention defined in the divisional application D1 and that of the parent is that rather than defining the configuration of the computer system from scratch, the user is presented with the configuration settings of an existing computer system as a sort of head-start. I have already found that the steps of capturing information from the user, comparing that information with a record of the hardware resources available, determining the necessary configuration settings and then configuring the resources accordingly fall solely within the meaning of a computer program. The added step of basing the configuration settings upon an existing computer system seems to me to involve nothing more than standard instructions for interrogating a database for specific settings and presenting these settings to the user for possible modification. There is no change in the manner that the individual hardware resources

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<sup>2</sup> [1997] RPC 608

are configured other than the automatic nature of the configuration as discussed above. Whilst I can readily accept that the contribution provides an opportunity to reduce the amount of time involved in specifying the resource specification of a computer system, I consider that such an advantage is brought about entirely by means of standard data processing instructions. In which case, I find that the contribution falls solely within the meaning of a program for a computer set out in section 1(2)(c).

- 26 Amended claims 1a and 1b limit the step of modifying the specification of the computer system to manual modification, which I have already found to fall wholly within the meaning of a computer program. I can find nothing in the application that would extend the contribution made by the inventions defined by the three versions of claim 1 beyond the limits of a program for a computer. As was the case with the parent application, there is no need for me to proceed to the fourth step of considering whether or not the contribution is technical in nature.

ii) divisional D2

- 27 Subject to the clarity issues raised by the examiner, no particular difficulty arises in construing claims 1 and 1a of divisional application D2. As Mr Bryson says in his skeleton argument, the contribution may be characterised as an improved method of configuring a computer system (or part) involving automatic provisioning, where the method enables and facilitates the correction of unintended results detected during the execution of the provisioning transaction. He says that the advantage lies in the facility to enable an automatic roll-back of one or more steps of the provisioning transaction, to a previous stage in that transaction, rather than having to determine how to “undo” an unintended result. He also says that the method may be seen as a solution to a problem within the computer system (or, possibly, represents a technical process outside the computer system, in that the computer system could be said not to exist until provisioned).
- 28 At the hearing, Mr Bryson accepted my point that the “undo” facility exists as a computer program equipped to uninstall any unintended provisioning instructions, but argued that the contribution extended beyond the specific “undo” instructions themselves and to the general method of automatically detecting and correcting for configuration errors. This method is described at pages 24 and 25 of the description as follows:

“In accordance with one embodiment of the present invention, a capability is provided to undo one or more of the operations performed by the transaction in physically configuring a computer system to meet the requirements of the provisioning request. In this respect, it should be appreciated that the provisioning of a computer system may be an iterative process, wherein an administrator initially may decide to perform a certain configuration operation, but thereafter detect an unintended result and wish to undo the operation. Thus, in accordance with one embodiment of the present invention, the entire provisioning transaction can be undone. In accordance with another embodiment, (...) a subset of the operations can be undone.”

“In accordance with the present invention, the undo or roll-back feature is implemented by creating a rollback routine at the same time the transaction is created. Thus, during creation of the transaction, for each operation created, a parallel operation is created to undo it. In this manner, the entire transaction can be undone by executing the entire parallel undo transaction, or the transaction can be rolled back to any particular operation by executing only the corresponding undo operation in the parallel undo transaction.”

- 29 What I take from all of this is that the step of detecting an undesired configuration of the hardware resources is a manual one taken by the user, and that the undo function is merely an act of re-configuring the hardware resources into a pre-existing state that the user is happy with. In general, the act of re-configuring hardware resources to a pre-existing state is precisely the same as that of configuring the resources in the first place, albeit with a different start and end point, and I have already found the step of configuring hardware resources to fall wholly within the meaning of a computer program.
- 30 On the face of it, the additional manual step of triggering re-configuration upon detection of an unintended result cannot as easily be categorised as a computer program because it involves a manual decision to be taken outside of the computer system. However, this manual act of triggering re-configuration is no different to the act that existed under previous manual configuration arrangements, i.e. once the user becomes aware of an unintended result in the configuration process then he/she has to correct it. That being the case, the actual contribution can then be seen to be in the manner in which the hardware resources are re-configured, which I consider to fall solely within the meaning of a program for a computer as set out in section 1(2)(c). In addition, there is nothing in the remainder of the application that would extend the contribution beyond the limits of a program for a computer, and it is not necessary for me to proceed to the fourth step of considering whether or not the contribution is technical in nature.

#### **Inventive step & clarity**

- 31 In view of the decision I have reached in relation to excluded matter, there is no need for me to decide whether the invention defined in the parent application involves an inventive step or whether the invention defined in divisional application D2 is both clear and supported by the description.

#### **Conclusion**

- 32 I have found that the inventions in the parent application, the divisional application D1 and divisional application D2 are concerned solely with programs for a computer, and that as such they are excluded from patentability by section 1(2). I can find nothing in these three applications that could form the basis of a patentable invention and therefore refuse each one in accordance with section 18(3).

#### **Appeal**

- 33 Under the Practice Direction to Part 52 of the Civil Procedure Rules, any appeal must be lodged within 28 days.

**H Jones**

Deputy Director acting for the Comptroller

## Annex 1

### CLAIMS (PARENT APPLICATION):

1. A method of provisioning at least a portion of a computer system to meet a specification, provided in a provisioning request, the method comprising:  
  
creating a computer-readable provisioning request which provides a specification of a desired configuration for the computer system and which request includes components relating to host computer based information, storage system based information which defines the at least a portion of the computer system to comprise a unit of storage to be provided to at least a certain one of a plurality of host computers, and connectivity resource related information;  
  
inputting the provisioning request to an automated provisioning process; and  
  
implementing the automated provisioning process, the automated provisioning processing comprising the acts of:
  - a) reading the provisioning request,
  - b) automatically provisioning the at least a portion of the computer system to meet the specification provided in the provisioning request, including acts of:
    - b1) selecting at least one logical volume of storage from at least one storage system that can serve as the unit of storage defined by the provisioning request;
    - b2) selecting at least one connectivity resource that can provide a communication path through which the selected at least one logical volume can be made accessible to the at least a certain one of the plurality of host computers;
    - b3) creating a transaction that comprises a series of actions to configure the selected at least one logical volume and the selected at least one connectivity resource to satisfy the provisioning requests, including configuring the selected at least one logical volume to satisfy the provisioning request, mapping the selected at least one logical volume to at least one port of the at least one storage system through which the selected at least one logical volume will be accessible, configuring the communication path, and configuring the at least a portion of the computer system to provide access to the selected at least one logical volume only to the at least a certain one of the plurality of host computers; and
    - b4) configuring the selected at least one logical volume and the selected at least one connectivity resource in a manner that satisfies the provisioning request by executing the transaction.
2. The method of claim 1, wherein the at least one storage system presents logical volumes of storage that can be used to store information, and wherein the act (b2) comprises an act of creating a transaction that creates a mirrored relationship between at least two logical volumes.



18. A computer system comprising:

a plurality of resources including at least one host computer, at least one storage system, and at least one connectivity resource that connects the at least one host computer to the at least one storage system; and

at least one processor programmed to automatically provision at least a portion of a computer system to meet a specification provided in a provisioning request that defines the at least a portion of the computer system to comprise a unit of storage to be provided to at least a certain one of a plurality of host computers, the at least one processor being programmed to:

select at least one logical volume of storage from at least one storage system that can serve as the unit of storage defined by the provisioning request;

select at least one connectivity resource that can provide a communication path through which the selected at least one logical volume can be made accessible to the at least a certain one of the plurality of host computers;

create a transaction that comprises a series of actions to configure the selected at least one logical volume and the selected at least one connectivity resource to satisfy the provisioning requests, including configuring the selected at least one logical volume to satisfy the provisioning request, mapping the selected at least one logical volume to at least one port of the at least one storage system through which the selected at least one logical volume will be accessible, configuring the communication path, and configuring the at least a portion of the computer system to provide access to the selected at least one logical volume only to the at least a certain one of the plurality of host computers; and

execute the transaction to configure the selected at least one logical volume and the selected at least one connectivity resource in a manner that satisfies the provisioning request; and

means for supporting said configuration actions to configure the computer system.

19. The system of claim 18, wherein the at least one storage system presents logical volumes of storage that can be used to store information, and wherein the at least one processor is programmed to create a transaction that creates a mirrored relationship between at least two logical volumes.

## Annex 2

### CLAIMS (D1):

1. A method of provisioning at least a portion of a desired computer system, the method comprises acts of:
  - a) automatically reverse engineering at least a portion of an existing computer system to create a specification of a configuration of the at least a portion of the existing computer system;
  - b) modifying the specification of the at least a portion of the existing computer system to create a specification for the at least a portion of the desired computer system, creating a provisioning request which defines the specification for the at least a portion of the desired computer system; and
  - c) automatically provisioning the at least a portion of the desired computer system to meet the specification for the desired computer system by supplying the provisioning request to an automated provisioning process.
- 1a. A method of provisioning at least a portion of a desired computer system, the method comprises acts of:
  - a) automatically reverse engineering at least a portion of an existing computer system to create a specification of a configuration of the at least a portion of the existing computer system;
  - b) manually modifying the specification of the at least a portion of the existing computer system to create a specification for the at least a portion of the desired computer system, creating a provisioning request which defines the specification for the at least a portion of the desired computer system; and
  - c) automatically provisioning the at least a portion of the desired computer system to meet the specification for the desired computer system by supplying the provisioning request to an automated provisioning process.
- 1b. A method of provisioning at least a portion of a desired computer system in order to replicate at least a portion of an existing computer system, the method comprising acts of:
  - a) automatically reverse engineering at least a portion of an existing computer system to create a specification of a configuration of the at least a portion of the existing computer system, the specification including at least one characteristic of at least one storage resource in the existing computer system;
  - b) manually modifying the specification of the at least a portion of the existing computer system to create a specification for replicating the at least a portion of the existing computer system, creating a provisioning request which defines the specification for the at least a portion of the desired computer system based on the existing computer system; and
  - c) automatically provisioning the at least a portion of the desired computer

system to meet the specification for the desired computer system by supplying the provisioning request to an automated provisioning process.

### **Annex 3**

#### CLAIMS (D2):

1. A method of configuring at least a portion of a computer system to meet a desired specification provided in a provisioning request, the method comprising inputting the provisioning request to an automatic provisioning process which generates a configuration for the computer system by carrying out the steps of:

creating a computer-readable provisioning transaction that comprises a series of provisioning actions to configure a plurality of computer system resources to meet the desired specification;

during creation of the computer-readable provisioning transaction, creating a parallel computer-readable undo transaction that comprises a series of undo actions to undo each of the provisioning action in the provisioning transaction;

executing the provisioning transaction to provision the at least a portion of the computer system to meet the desired specification, and, if an unintended result of one of the provisioning actions is detected;

executing at least a portion of the undo transaction to rollback the configuration of the at least a portion of the computer system.

- 1a. A method of configuring a plurality of computer system resources to meet a desired specification provided in a provisioning request, for at least a portion of a computer system the method comprising inputting the provisioning request to an automatic provisioning process which generates a configuration for the computer system by carrying out the steps of:

creating a computer-readable provisioning transaction that comprises a series of provisioning actions to configure the plurality of computer system resources to meet the desired specification;

during creation of the computer-readable provisioning transaction, creating a parallel computer-readable undo transaction that comprises a series of undo actions to undo each of the provisioning action in the provisioning transaction;

executing the provisioning transaction to generate the configuration for the at least a portion of the computer system to meet the desired specification, and, if an unintended result of one of the provisioning actions is detected;

executing at least a portion of the undo transaction to rollback the configuration of the at least a portion of the computer system.