

Maintenance	<ul style="list-style-type: none"> • Carries out network monitoring and preventative maintenance • Performs operational management of the network • Recovers the network infrastructure in the event of a disaster
Who?	A full-time staff technician or service provider
Important!	
<ul style="list-style-type: none"> • Network monitoring requires software tools, which can vary in price. If your school employs a full-time staff technician, you should allow a budget for monitoring tools. If you use a service provider, they should provide the tools. • There are obvious links between design, implementation and maintenance, so using the same person or service provider for all three may make sense. 	

Summary of tasks		
Start-up or occasional tasks	Regular tasks	Frequency
Start-up task 1 Provide ICT service details to the ICT owner.		Do this before your Primary FITS start date. Review annually
Start-up task 2 Create an asset log.		This is most effective done alongside start-up task 1, which must be before your Primary FITS start date.
Start-up task 3 Create a licence list.		You must do this before your Primary FITS start date.
Start-up task 4 Create a network diagram.		You may do this after your Primary FITS start date. Review annually
Start-up task 5 Check the quality of the network cabling.		You may do this after the Primary FITS start date.
Start-up task 6 Prepare a disaster recovery plan.		You may do this after your Primary FITS start date. Review annually
	Monitor network performance.	Daily
	Resolve network problems when they occur and resolve potential network problems before they occur.	As required
	Carry out regular infrastructure equipment servicing activities.	As required

Summary of tasks

Start-up or occasional tasks	Regular tasks	Frequency
	Seek prior approval, using request for change forms, before planning and implementing any work that may require expenditure or cause disruption to the ICT service.	As required
Carry out audits.		Annually
Work towards implementing FITS Operations Management.		Ongoing
In the event of the loss of ICT services, carry out the disaster-recovery plan.		As required

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1. Provide ICT service details

Outcomes

Once you have fully completed this task, you will have:

- Described the baseline ICT service
- Given the ICT owner details of services and equipment for the service catalogue
- Enabled the ICT support requirement to be quantified.

Introduction to task

The ICT owner is required to produce a service catalogue in order to identify and describe the ICT services used by the school, and which therefore need support. This information itemises the ICT services such as email, printing, interactive whiteboard and so on.

Through dealing with the ICT infrastructure as a whole, the person carrying out maintenance is best placed to identify these services and components.

You will need

From the toolkit CD (Primary FITS tools\Service Level Management\)

- Service catalogue template
- Service catalogue example

Instructions for providing ICT service details

1. Download the documents you need from the toolkit CD:
 - *Primary FITS tools\Service Level Management\Service catalogue template.xls*
 - *Primary FITS tools\Service Level Management\Service catalogue example.pdf*
2. When requested by the ICT owner, fill in the first column of the service catalogue template with the names of all ICT services used in the school.
3. Give the service catalogue to the ICT owner for completion.

2. Create an asset log

Outcomes

Once you have fully completed this task, you will have:

- A baseline asset log against which the single point of contact can apply changes
- Information for the service catalogue.

Introduction to task

An asset log is a list of all ICT equipment in the school and can be used for:

- Planning changes
- Financial reporting
- Specifying maintenance contracts
- Contributing to the service catalogue
- Locating equipment
- Tracking the movement of equipment
- Identifying losses.

You will need

From the toolkit CD (Primary FITS tools\ Configuration Management\)

- Asset log template
- Asset log example
- Asset log notes for completion

You create the asset log initially by conducting an audit. Thereafter the single point of contact keeps the log up to date by using the information on request for change forms.

Creating the initial baseline asset log can be a time-consuming task, but it should be a one-off exercise, provided that request for change forms are produced for all changes and include full details.

You may find it helpful to combine this task with task 1 and task 3.

Instructions for creating an asset log

1. Download the documents you need from the toolkit CD:
 - *Primary FITS tools\ Configuration Management\ Asset log template.xls*
 - *Primary FITS tools\ Configuration Management\ Asset log example.pdf*
 - *Primary FITS tools\ Configuration Management\ Asset log notes for completion.doc*
2. Carry out an audit of the school's ICT equipment, recording your findings in the asset log template. For guidance use the example and notes for completion.
3. Give the completed asset log to the single point of contact for filing and upkeep.

Tip

Try to set aside enough time to carry out the audit in one go, so that the single point of contact does not need to apply changes that occur during the course of the exercise.

3. Create a licence list

Outcomes

Once you have fully completed this task, you will have:

- A baseline licence list against which the single point of contact can apply changes.

An up-to-date licence list can be used for:

- Proving legal compliance with software licensing laws
- Tracking licence allocation
- Ensuring that licences already paid for are used before further costs are incurred.

Introduction to task

A licence list is essential to avoid installing unlicensed software accidentally.

The licence list is created initially through an audit by maintenance and kept up to date by the single point of contact, using information from requests for change and install build checklists.

It may be helpful to combine this task with task 2 (creating an asset log) since both tasks require visits to all the school's computers.

You will need

From the toolkit CD (Primary FITS\
Configuration Management\)

- Licence list template
- Licence list notes for completion

Instructions for creating a licence list

1. Download the document you need from the toolkit CD:
 - *Primary FITS tools\Configuration Management\Licence list template.xls.*
 - *Primary FITS tools\Configuration Management\Licence list notes for completion.doc*
2. Carry out an audit of the school's ICT software licences and their allocation and record your findings in the licence list template. Use the notes for completion for guidance.
3. Give the completed licence list to the single point of contact for filing and upkeep.

4. Create a network diagram

Outcomes

Once you have fully completed this task, you will have:

- Tools to help you monitor the network
- Tools to help you resolve problems
- Tools to help you identify single points of failure (risks)
- Tools to help you plan changes
- Tools to communicate the ICT infrastructure.

Introduction to task

Network diagrams are used to help monitor the network and resolve problems. There are two types of diagram:

- The physical network diagram, which describes each physical component and illustrates the ways in which the different components are connected
- The logical network diagram, which shows the relationships between components and the flow of information through the network.

It is possible to create network diagrams using pencil and paper, but we recommend using one of the specially designed network mapping tools on the market.

You will need

- Network diagramming tools (software or pencil and paper)

From the toolkit CD (Primary FITS tools\Configuration Management\)

- Physical network diagram example
- Logical network diagram example

Instructions for creating a network diagram

1. Select a tool for creating network diagrams.
2. Download the documents you need from the toolkit CD:
 - *Primary FITS tools\Configuration Management\Physical network diagram example.pdf*
 - *Primary FITS tools\Configuration Management\Logical network diagram example.pdf*
3. Create a physical network diagram of your network, using the physical network diagram example for guidance.
4. Create a logical network diagram of your network, using the logical network diagram example for guidance.
5. Give these network diagrams to the single point of contact for filing centrally.
6. Review the network diagrams annually.

Tip

Changes to the network topology will take place only as a result of design changes. Implementation will carry out such changes and update network diagrams. Remember that it is important to review diagrams for accuracy at least once a year.

5. Check network cabling

Outcomes

Once you have fully completed this task, you will have:

- Identified any potential network problems
- Planned to resolve any potential network problems
- Ensured that the underlying physical cabling structure is performing as expected before you start monitoring network traffic.

Introduction to task

The quality of the network cabling has a considerable effect on network performance. If the cabling is not of high enough quality, monitoring the network may be problematic and you may have difficulty obtaining accurate results from even the best network-monitoring software.

Before starting to monitor the network, you should check the quality of the network cabling, and repeat the cable check again at least once a year thereafter.

Testing network cabling is a specialist task. If the person performing the maintenance function does not have suitable network-management skills, the school should contact its service provider. They will have the ability to select a suitable network cable tester and use it to detect the causes of any signal degradation.

You will need

- A suitable network cable tester

Instructions for checking network cabling

1. Select a suitable network cable tester.
2. Test the network cabling and look for any causes of signal degradation.
3. Make plans to resolve any issues identified. See task 7 for instructions on doing this.
4. Repeat the exercise annually.

6. Monitor network traffic

Outcomes

Once you have fully completed this task, you will have:

- Insight into what is happening on the network
- The ability to detect problems
- The ability to detect potential problems
- The ability to minimise the elapsed time between occurrence and resolution of problems
- Data which you can monitor over time in order to identify trends
- Improved chances of reducing network downtime.

Introduction to task

Task 5 is about ensuring that the network's underlying physical cabling structure is performing as expected. In order to be sure that the network as a whole is healthy, the next step is to monitor and test the network traffic and messages generated by the network protocols.

This involves selecting and implementing tools that are suitable for your network. Because every school's needs are different, we can't provide explicit instructions for doing this. If the person performing the maintenance function does not have suitable network-management skills to select, install, configure and use suitable network-monitoring software, the school should contact its service provider.

You will need

- Suitable network-monitoring software

From the toolkit CD (Primary FITS tools\Availability and Capacity Management\)

- Network monitoring suggested activities

Instructions for monitoring network traffic

1. Download the documents you need from the toolkit CD:
 - *Primary FITS tools\Availability and Capacity Management\Network monitoring suggested activities.doc*
2. Select, install and configure suitable network monitoring software.
3. Produce a baseline report, showing the starting point against which to measure network traffic and performance. For guidance, see the network monitoring suggested activities.
4. Perform the same activities regularly. If possible, automate them. Use the output to:
 - Identify network problems and resolve them
 - Identify potential network problems and pre-empt them
 - Monitor trends.

Tip

When resolving network problems it will be necessary to complete a request for change if:

- A financial cost needs approval
- The equipment in question is used by more than one person
- General user access to ICT services is affected by the installation.

See task 8 for more information about requests for change.

7. Carry out preventative maintenance

Outcomes

Once you have fully completed this task, you will have:

- Ensured that your ICT equipment is kept in good condition
- Prevented potential problems
- Maximised the life expectancy of your ICT equipment.

Introduction to task

Preventative maintenance is about what you can do to prevent any component of your network from failing. In Primary FITS this includes:

- Client computers (also referred to as workstations) – whether PC, Apple, laptop or PDA
- Servers – the computers that control specific parts of the network.

You will need to perform preventative maintenance tasks weekly, monthly, quarterly or annually, depending on the nature of the task.

You will need

From the toolkit CD (Primary FITS tools\Availability and Capacity Management\)

- Preventative maintenance schedule template
- Preventative maintenance schedule notes for guidance

Instructions for carrying out preventative maintenance

1. Download the documents you need from the toolkit CD:
 - *Primary FITS tools\Availability and Capacity Management\Preventative maintenance schedule template.doc*
 - *Primary FITS tools\Availability and Capacity Management\Preventative maintenance schedule notes for guidance.doc*
2. Using the template, create a maintenance schedule for each server and computer. Use the notes for guidance to help you decide the frequency and method.
3. Carry out preventative maintenance as scheduled.

Tip

When scheduling some server maintenance, you will need to create a request for change form, because ICT services will be disrupted. To save administrative effort, plan your maintenance dates for the year ahead and create just one request for change. You will need to remind users as each scheduled date approaches, though.

8. Complete request for change forms

Outcomes

Once you have fully completed this task, you will have:

- Gained approval to spend time and money on changes
- Planned changes consistently
- Gained approval to carry out changes at the scheduled times
- Given users an opportunity to request adjustments to the scheduling of changes
- Thought through the steps to be taken to execute changes
- Considered the impact of changes on other ICT services
- Considered what to do if a change causes a problem with other ICT services
- Contributed to monthly service reports, enabling trend analysis of change success and failure.

Introduction to task

The purpose of a request for change form is to ensure that all changes to ICT services are approved and planned consistently before they are implemented.

A change may be:

- The replacement or introduction of any shared hardware or software
- Anything that will incur a financial cost
- Anything that may affect general user access to one or more of the school's ICT services.

A request for change is completed in three steps and approval by the ICT owner is required for the first two.

Step 1: Approval to proceed with a change

Step 2: Approval to implement a change

Step 3: Outcome of change

Step 1

This is completed when a change has been identified and approval is sought to develop the change and incur any necessary costs. Minimal information is required at this stage:

- **Unique identifier(s)** – asset references of all affected equipment
- **Name(s) of item(s)** – names of all affected equipment
- **Brief description of change** – a summary proposal
- **Reason for change**
- **Cost of change** – if there is a cost
- **Originator name** – the name of the person completing the request for change form.

You will need

From the toolkit CD (Primary FITS tools\Change Management\)

- Request for change template
- Request for change example
- Request for change notes for completion

Step 2

This is completed when approval for step 1 has been granted. This step adds detail about the change and seeks approval to implement the change as described:

- **Full details of change** – a detailed plan of the change
- **Impact on services and users** – how the implementation of the change will affect existing ICT services and users
- **Impact and risk of change failure** – what the implications would be if the change failed
- **Fallback plan** – how service would be restored if things go wrong
- **Date and time of change** – the proposed date and time of implementation
- **Implementer name** – the name of the person who will carry out the change.

Step 3

This is completed following implementation of the change to indicate the outcome:

- **Implementation successful, unsuccessful, partially successful** – for monthly service report statistics
- **Notes on outcome** – to provide details of asset changes, failure or partial failure of the change.

Instructions for completing request for change forms

1. Download the documents you need from the toolkit CD:
 - *Primary FITS tools\Change Management\Request for change template.doc*
 - *Primary FITS tools\Change Management\Request for change example.pdf*
 - *Primary FITS tools\Change Management\Request for change notes for completion.doc*
2. Print out the request for change template and complete step 1, using for guidance the notes for completion.
3. Pass the request for change with step 1 completed to the ICT owner for approval to proceed.
4. When approval to proceed has been granted and the request for change returned to you to confirm this, you can go ahead and plan the change. The next step requires you to complete step 2 of the request for change with details of the plan – for guidance see the notes for completion.
5. When you have completed step 2, pass the request for change to the ICT owner for approval to implement the change.
6. When approval to implement the change has been granted and the request for change returned to you to confirm this, you can go ahead and implement the change.
7. Following implementation, complete step 3 of the request for change form, using for guidance the notes for completion.
8. Give the completed request for change to the single point of contact for filing.

Tip

Plan as far ahead as possible – the ICT owner will need time to consider requests for change and make sure that the scheduling doesn't clash with any user plans.

9. Carry out audits

Outcomes

Once you have fully completed this task, you will have:

- Brought the asset log and licence list up to date
- Identified any major discrepancies that may need to be investigated
- Identified any process failures that may need to be addressed.

Introduction to task

Keep the asset log and licence list you created in task 2 and task 3 up to date, using information from the requests for change affecting:

- New items purchased
- New items installed
- Old items decommissioned
- Replacements for maintenance and resolving problems.

In a perfect world this would mean that asset and licence details are always accurate. However, in real life mistakes arise, so it is important to check records against the assets and licences you have, at least once a year, in order to rectify inaccuracies and create a new baseline.

You will need

From the single point of contact

- Asset log
- Licence list

Instructions for carrying out audits

1. Get the documents you need from the single point of contact:
 - Asset log
 - Licence list.
2. Audit the school's ICT equipment and software licences, checking your findings against the asset log and licence list.
3. Amend the asset log and licence list as necessary, and rename the documents by adding a version number.
4. Give the new versions of the asset log and licence list to the single point of contact for filing.

Tip

It may be appropriate to investigate major discrepancies and inform the ICT owner, so:

- Check all requests for change for omissions
- Check all incident and problem sheets for unreturned loans.

10. Prepare a disaster-recovery plan

Outcomes

Once you have fully completed this task, you will have:

- Prepared for the recovery of ICT services in the event of the destruction of the original services
- Contributed to the contingency plan for use in the event of a prolonged ICT outage.

Introduction to task

The ICT owner is responsible for preparing a contingency plan to be invoked in the event of a prolonged loss of ICT services. The contingency plan gives details of how the school will continue its business without ICT tools, focusing on manual fallback methods.

In the event of this happening, you will need a plan for restoring the ICT services to working order, so that the school can return to using them. This is the disaster-recovery plan that you are responsible for preparing.

You will need

From the toolkit CD (Primary FITS tools\Service Continuity Management\)

- Disaster-recovery plan template
- Disaster-recovery plan notes for completion

Instructions for preparing a disaster-recovery plan

1. Download the documents you need from the toolkit CD:
 - *Primary FITS tools\Service Continuity Management\Disaster recovery plan template.doc*
 - *Primary FITS tools\Service Continuity Management\Disaster recovery plan notes for completion.doc*
2. Complete the disaster-recovery plan template, using for guidance the notes for completion.
3. Give the disaster-recovery plan to the single point of contact for filing.
4. Inform the ICT owner of the location and name of the disaster-recovery plan, so that details can be included in the contingency plan.
5. Invoke the disaster-recovery plan as required.

Tip

It makes sense to keep a hard copy of the plan plus all the associated instructions off site, just in case you can't access the electronic versions when you need them.

11. Work towards implementing FITS Operations Management

Outcomes

Once you have fully completed this task, you will have:

- Acknowledged the need for the FITS OM procedures
- Allocated responsibility for the FITS OM procedures
- Embarked on the continuous improvement of ICT operations.

Introduction to task

FITS Operations Management (FITS OM) is a set of procedures that complement FITS and Primary FITS.

There are six components to FITS OM:

- Systems Administration – the allocation and management of all the other FITS OM functions
- Storage Management (the operation and maintenance of data and its storage media)
- Directory Services Administration (the management of the ICT services information database)
- Print and Output Management (production and management of printed and electronic output)
- Security Administration (the maintenance of a safe computing environment)
- Patch Management (the management and deployment of updates to hardware and software).

We recommend that you start working towards implementing these procedures once you have implemented Primary FITS. Many of the activities in FITS OM are supported by Primary FITS procedures such as creating requests for change.

You will need

- FITS OM
[<http://becta.org.uk/fitsom>]

Instructions for implementing FITS Operations Management

FITS OM is a discrete package that is complementary to both FITS and Primary FITS. You can find all the information you need to set up FITS OM at your school on Becta's FITS OM website [<http://www.becta.org.uk/fitsom>].