



***Introducing ITIL® Availability Management***

***Author : George Ritchie, Serio Ltd***  
*email: george -dot- ritchie -at- seriosoft.com*

## **Copyright, trademarks and disclaimers**

Serio Limited provides you access to this document containing information on the terms and conditions outlined below. By using this document you are agreeing to these terms and conditions. Serio Limited reserves the right to change these terms and conditions from time to time at its sole discretion.

COPYRIGHT NOTICE : Serio Limited, 14 Grampian Court, Beveridge Court, Livingston EH54 6QF Scotland, UK.

### **Terms and Conditions of Use**

Except as expressly prohibited by this statement, you are permitted to view, copy, print, and distribute this document subject to your agreement that:

You will not modify the documents or graphics.

You will not host a copy of this White Paper on another web (<http>) server.

You will not copy or distribute graphics separate from their accompanying text and you will not quote materials out of their context.

You will display the above copyright notice and the below trademark notice on all documents or portions of documents and retain any other copyright and other proprietary notices on every copy you make.

You agree that Serio Limited may revoke this permission at any time and you shall immediately stop your activities related to this permission upon notice from Serio Limited.

The permission above does not include permission to copy the design elements, look and feel, or layout of this document.

The Serio logo is a registered trademark of Serio Ltd.

ITIL is a registered trademark of the Office of Government Commerce.

## **Intended Audience**

Those involved in IT Service Management who have had some exposure to ITIL®, and who wish to find out more about what is involved in Availability Management.

## **Purpose of this White Paper**

To explain some of the basics of Availability Management, providing practical help and examples wherever possible. At the end of this White Paper you'll find sample graphs, and a template management report.

## **Further Reading**

I can recommend the following book as a definitive source on Availability Management: '*Service Delivery*' published by TSO, ISBN 0 11 330015 8. I have quoted directly from this book in this White Paper in some places, where I have done so is clearly marked.

I can also recommend another Serio White Paper by the same author entitled '*Service Desk/Helpdesk Metrics and Reporting : Getting Started*'. This can be downloaded at <http://www.seriosoft.com>.

## Availability Management in a Nutshell

In a nutshell: Availability Management is

- Identifying your organisation's key IT systems and services
- Determining the Availability requirements for these systems and services
- Working to ensure that those Availability requirements are met in a cost effective way
- Reporting, monitoring, & improving IT Availability

### **This White Paper is Brought to you by Serio**

Try Serio Service Desk today – a hosted, Enterprise-class IT Service Management and support system. Visit us at

*<http://www.seriosoft.com>*

for your free trial.

## **Why do Organisations need Availability Management?**

When I first graduated from University in the mid 1980's and started work in various IT support roles, the systems I dealt with were typically needed during what I'd call normal business hours (8:00 to 18:00) or 'extended business hours' (8:00 until 20:00). It was quite normal to shut down systems at the end of the business day in order to back them up, at the convenience of the IT service desk.

At that time, here in the UK retail business closed at 17:30, banks closed at 15:00, and it was almost impossible to buy anything on a Sunday. Cash machines operated by banks were frequently not available late at night due to 'scheduled maintenance'.

If we skip forward 20 years to the present day, everything has changed. Of course there is the internet which has made a profound change in how and *when* we expect to access IT services, but the change is more than just technological and more than the internet.

Consumer and business expectations about availability of goods and services has also totally changed. Consumers now expect to be able to do things that they could not do 20 years ago, such as contacting their bank or credit card company at any time, or making a purchase from a catalogue or web site at their convenience in the evening.

Even government has responded. Access to training services, health information and more can be made at any time either by telephone or online via the internet.

All of this activity requires Information Technology in order to provide the service people and business want and expect, and in doing so it places an increasing emphasis on Availability. Quite simply, customers will come to view the organisation with disdain if systems they wish to use are unavailable when the customer has been lead to expect they will be available, or are unavailable when customers feel they should be available.

It is Availability Management that provides us with a framework where the Availability needs of the business may be firstly understood, and then delivered.

At this point I'd stress that Availability Management is much more than adding redundant components into your IT infrastructure, and is more than the latest generations of fault-tolerant hardware (though such things undoubtedly play a part). Availability Management is a process, and, if used intelligently and systematically, can produce business benefits without recourse to significant capital outlay.

### **Availability Management – Are You Ready?**

ITIL® has many disciplines with it, of which one is Availability Management. It has dependencies upon other ITIL® disciplines such as:

- Incident Management
- Problem Management
- Service Level Management
- Configuration Management
- Change Management

My personal view is that you will get the best results when your Incident and Problem Management procedures are mature, and they you have a complete and accurate Configuration Management Data Base (CMDB) from which to work.

### **Guiding Principles of Availability Management**

Principal 1: 'Availability is at the core of business and user satisfaction'<sup>1</sup>

The IT organisation, and the wider business, need to appreciate that whilst new features – 'whistles and bells' – are appreciated by customers, they will only be appreciated if Availability is maintained at the appropriate level.

**Principal 2:** 'Recognising that when things go wrong it is still possible to achieve business and user satisfaction<sup>2</sup>'

The fact is that sometimes things go wrong: failsafe devices don't work, something totally unforeseen happens – and service Availability is affected.

How well your Incident Management procedures cope at this point is crucial in terms of how the business and user community views the quality and professionalism of the IT organisation. Clearly speed of recovery is crucial, but other factors are also important. I would cite the following as key:

- How well the business and user community is helped to cope with the impact of the fault. Planning for the needs of the business in the event of failure is part of the Availability Management process.
- How clearly and effectively the Service Desk communicates with users about the fault.<sup>3</sup>
- Publishing, at an early stage, a realistic and accurate date and time at which normal service will be resumed. In my experience this is the key data item users want, especially if these are users who are dealing with customers and having to explain that 'I cannot help you as the system is down at the moment...'

**Principal 3:** 'Improving Availability can only begin after understanding how the IT Services support the business<sup>4</sup>'

Principal 3 is reminding us not to take a technologist's view of the technology we are dealing with, and for the Availability Manager to understand how systems are used by, and support, the activities of the business. This means an end-to-end (in context) understanding of systems, and well as a component-by-component understanding of the IT infrastructure by which how those systems are delivered.

## **Getting Started with Availability Management**

Hopefully by now you've got an understanding of what Availability Management is (at least from a theory point of view), and why it is an important IT Service Management discipline.

What I want now is talk about some of the things that Availability Management entails, and how you get started in a practical way.

### **Appoint an Availability Manager**

This is probably the single most important thing you can do if you are starting out with Availability Management. It creates a single point of

responsibility for IT systems availability, and a champion of Availability planning within the IT organisation.

If your budget or IT operations don't justify the appointment of a specialist person for this role, locate a suitable person within the organisation and add 'Availability Manager' to the roles that that individual performs. If doing this, be careful to ensure that sufficient time is allotted from their weekly schedule to the Availability Management task, and that the importance of the task is clearly explained.

### **Identify your Key IT Services**

This is where you define the extent of Availability Management role, by cataloging your key IT systems and services (I'll call these *Key Services*). Don't be tempted to approach this from a technologist's perspective by asking 'what systems do we have'. Instead, consider the key business functions performed by your business, and from these identify the Key Services involved in that delivery. For each business function, define an impact assessment describing the impact on the business of a loss of Key Services.

For example, you might work in a direct-sales operation. All sales go through your Sales Order Processing system, and so you list this as a Key Service. However, in looking at the sales function you note that 50% of new orders arrive by email and therefore add your email system to the list of Key Services for the sales function.

### **Define the Availability Requirements for your Key Services**

There are many ways you can approach to defining your Availability Requirements. My advice is to use a Service Level Agreement to define the required hours of operation for the Key Service. ITSM tools often support this directly – for example, Serio allows you to associate an SLA with a service and to use this SLA for Availability reporting.

Having defined an SLA, you need to define Availability and your reporting period – for example, weekly or monthly. Within that, you can choose to define:

- Maximum hours of downtime, expressed simply in hours and minutes
- Downtime as a percentage of availability. I'll describe how to calculate this later in this White Paper
- Maximum number of non-availability events

### **Define What Constitutes Unavailability for Key Services**

This may seem obvious, and in some cases it is: the IT organisation provides a service, this service has users, and when users can't access the service then it is Unavailable.

There are other factors to consider, particularly connected with Quality of Service.

Suppose that you have a Sales Order Processing system that *normally* takes 1-2 seconds to save a new order – and this is perfectly acceptable. However, consider that the time to save a new order shoots up to 60 seconds one day – does this constitute Unavailability? If so, what if the transaction time is 10 seconds rather than 60 – is this also Unavailability?

My advice is this: if the performance of a service, or the quality of an IT service, is degraded enough to cause significant business impact you should consider the event as Unavailability.

### **Create Contingency and Recovery Plans**

If you start from the assumption that faults will occur, you can go some way to plan for them.

It may be that there are steps than you take in time of need that will minimise business impact. Make sure that these are clearly documented, and if at all possible rehearsed & tested.

It's also worth making sure recovery & restart procedures are written down, and that staff involved in Incident Management know that they exist and where to find them. In my career, I've encountered numerous situations where various servers/switches have 'crashed' but only one or two people (who are not around when you need them) know the re-start/recovery procedure. Again, if you can, practice and test these procedures through rehearsal.

### **Examine the Information available for your Key Services**

IT Services are delivered by the IT infrastructure.

Your organisation's IT infrastructure is defined and documented within your Configuration Management Data Base (CMDB), giving you a detailed representation of each of the components that combine to deliver these Key Services – right?

Without this information it's going to be difficult (verging on impossible) for the Availability Management process to succeed. So, if you have no CMDB (or you have a CMDB which lacks detail and

accuracy) my best advice is to work on getting one in place before embarking upon Availability Management.

## **Availability Management Tasks**

Having discussed what you need to do to get started, it's now time to talk about some of the ongoing activities performed by Availability Managers.

In doing so, I'd stress that many of the tasks listed in 'Getting Started with Availability Management' above are *ongoing* tasks – for instance, you probably need to periodically review the Availability requirements of the business as they are subject to change.

### **Measuring and Reporting**

Measurement of Availability, and comparison of actual Availability against business requirements is an absolutely fundamental activity for each of your Key Services.

ITSM tools can help in this regard. Here at Serio for example, we produce a tool that measures Availability and Downtime statistics for you, emails you Availability and Downtime reports, and provides a running calculation of Availability. The tool is called Serio IT Service View Pro, and can be downloaded from our website at <http://www.seriosoft.com> (just follow the IT Service View link).

Availability Management also looks closely at failure in Key Systems from a business perspective, understanding & documenting the business effect of each Incident.

This topic is covered in further detail below – see 'Measuring & Reporting on Availability'.

### **Improving Availability**

The reports will tell you where Availability needs to be improved, and by using your key information resources (such as Incident and Problem records, and your CMDB) you can investigate which component(s) are responsible for IT failure – referred to as the Single Point of Failure (SPOF). Identification of alternative components to the SPOF is a part of Availability Management aiming specifically at reducing failure.

With this knowledge you can then produce a prioritised action plan for the improvement of Availability, by modifying the IT infrastructure to provide for higher levels of reliability.

One point to note: sometimes making what may seem to be modest improvements in Availability might be very costly. Availability Management seeks to cost-justify improvements in Availability.

### **Addressing Availability as a Requirement**

Availability Management tries to ensure that appropriate Availability is considered at the earliest opportunity when designing or procuring new IT systems, or upgrading/changing existing systems.

Generally speaking, the costs of retrospectively adding reliability costs far more than simply factoring it in at design time.

## Reporting on Availability<sup>8</sup>

Your reporting of Availability should, at all times, reflect the actual user experience – in practice this means a focus (for reporting) on the service as a whole as opposed to the components that deliver the service. For users, the following are the significant factors affecting their perception of Availability:

- Duration of Incidents that result in Unavailability
- The frequency with which such Incidents occur
- Duration & frequency of planned maintenance
- The scale and scope of Impact

Calculating basic availability as a percentage is straightforward:

$$\text{Availability} = ((\text{TST} - \text{DT}) / \text{TST}) * 100$$

where

TST = Total Service Time possible over the period for which the calculation is being made

DT = The actual down time recorded over the period for which the calculation is being made

Note that Serio performs calculations like this automatically for you for both Configuration Items and Services as appropriate, based on Incident data and the SLA attached to the CI/Service. You can access this data through the Performance charts within SerioClient.

Calculating the costs of Unavailability is quite important, and something you should consider as part of your reporting. The following matrix may help in determining costs:

|   |  |  |  |
|---|--|--|--|
| Key Service Name:   |  |  |  |
| Downtime (Hours) (DT):                                    |  |  |  |
| Users within the organisation affected (U) <sup>5</sup> : |  | Averaged cost (salaries, overheads) per user (PU): |  |
| Lost Business Revenue <sup>6</sup> per hour (LBR):        |  | Overtime working costs (OT) <sup>7</sup> :         |  |
| Sundry cost (S):  |  |  |  |

$$\text{Cost of Unavailability} = (\text{DT} \times \text{U} \times \text{PU}) + (\text{DT} \times \text{LBR}) + \text{OT} + \text{S}$$

Another approach you can take is to report straight downtime figures. My view is that your reports should make clear which downtime was unexpected (as a result of a fault) and which was as a result of planned maintenance. Again this kind of reporting is available for you in Serio – look in the Performance graphs in SerioClient.

## **Sample Availability Reporting Collateral**

Appendix A shows some sample Availability and Unavailability metrics produced directly from Serio. These will hopefully give you an idea of the data you can use to support Availability reports to business Management. Of course, your management report should include summary and analysis – as opposed to raw Availability data.

The following template may give you some ideas about how to approach this, if you are trying to produce your first Availability Management report.

### **Report Title**

Service Availability Analysis for Service *{Service Name}*

### **Prepared For**

Vice President of Technology, Vice President of Operations

### **Period Covered by this Report**

May 2006

### **Key Statistics**

*{ This is where you summarise the business Availability requirement, and outline the achievements made. If you have graphs or data from your ITSM system, consider referencing this data as an Appendix. The following might give you ideas as to what to include:*

*Required Hours of Operation, Target Availability*

*Actual Availability Achieved as a percentage or downtime in hours*

*Number of Incidents in the month that affected Availability*

*Costs of Unavailability. Include the bottom line cost here, include the working as an Appendix }*

### **Trends for Comparison**

*{ Use statistics here from the previous month so that if the trend is improving or worsening it is clear }*

### **Summary of Business Impact**

*{ This is where you summarise the affect on key business functions. As different parts of the business will be affected in different ways, there should be one entry per business function. }*

| <i>{Incident Reference Number}</i> | <i>{Business Function}</i> | <i>{Summary of business impact}</i> | <i>{Comments from business representative or manager}</i> |
|------------------------------------|----------------------------|-------------------------------------|---|
|------------------------------------|----------------------------|-------------------------------------|---|

### **Analysis of Loss of Service Events**

*{ Include information about Unavailability on an Event-by-Event basis. What you include is up to you, but the following might be useful. }*

*Cause of failure*

*Duration (either lost production hours or start/end times)*

*Objective assessment of how well the fault was handled, how recovery/restart procedures worked.*

*If you have an Availability Plan describe how the situation affects or reflects the Availability Plan.*

### **Future Actions and Recommendations**

*{ Draw on the information you've produced so far to formulate future actions. If these include capital expenditure be clear about how this will affect future downtime, and relate these costs back to the costs of Unavailability }*

## **Notes**

1. 'Service Delivery' ISBN 0 11 330015 8 (2000) – Office of Government Commerce.
2. Ibid.
3. Some tools, including Serio, have Service Status web pages updated by the Service Desk where users can refer for immediate information about key IT services.
4. Ibid.
5. It may be that you create multiple lines here, if different groups within the organisation have significantly different costs.
6. This may be difficult or impossible to compute. My advice is to quantify it when there are some objective measurements that can be made – for instance, by looking at the average value of orders per hour in an order fulfillment company.
7. In many cases, after periods of Unavailability, companies have to pay overtime to make up for lost production. You'll need to estimate this for each separate Unavailability Incident, if you decide to factor it into your calculations.
8. See also Serio White Paper entitled 'Service Desk/Helpdesk Metrics and Reporting : Getting Started'

## **Advantages of Availability Management**

ADV: Someone (the Availability Manager) is responsible for Availability within the enterprise – as opposed to responsibility being split across departments and groups. The Availability Manager owns the processes discussed within this document that relate to Availability, and can act as a 'champion' for Availability.

ADV: Data is collected and maintained on what the appropriate levels of Availability are for the organisation.

ADV: Reporting and measurement is put in place to see if the required Availability is being delivered.

ADV: A pro-active framework for correction of poor Availability is established, though the use of Availability plans, single point of failure analysis and other techniques.

ADV: Proper attention is given to the business impact of Unavailability.

ADV: The costs of Unavailability are more readily available.

## Frequently Asked Questions

**Q:** I can summarise very quickly the key IT services required by our business, and it is clear which services are affected when there is a problem. Why then is it so important to have a detailed configuration database before we consider measuring availability of these services?

**A:** Firstly, are you really sure that you can identify Key Services? I'd still advise you to approach this methodically by considering business functions in turn, as described in this White Paper.

To address your question, the CMDB is important because of it is necessary to have the components of the IT infrastructure that deliver services documented so that analysis of faults is conducted on a sound, rational footing – where all those involved in service delivery agree of the components used, and how they relate to one another. It's also essential to have a CMDB for accurate Availability reporting.

**Q:** The document gives me a clear idea about Availability Management. However, it would be helpful if you could summarise the tasks normally undertaken by the Availability Manager.

**A:** I've tried to describe the tasks undertaken throughout this document – from 'Getting Started with Availability Management' onwards. For instance, identification of Key Services, recovery procedures etc.

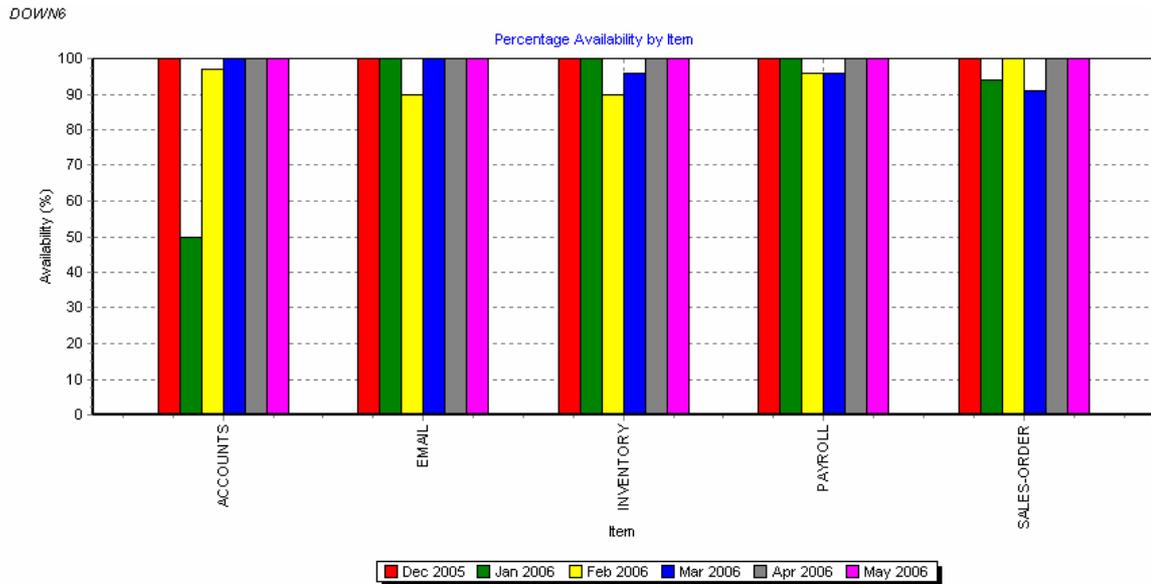
**Q:** The document describes how a system is considered Unavailable if it meets the criteria for unavailability specified in an SLA. You make clear that Unavailability can therefore cover situations where the system is available but the performance is degraded. This seems a little too black and white, especially when it so important to understand business impact and associated costs. Is there any case for the availability manager measuring hours of, for example, degraded performance, as well as non-availability?

**A:** Availability Management is all about Availability. If it helps, think about Unavailability being concerned with *significant business impact* – is the service meeting the needs of the business as you've previously defined them? If not, then you have Unavailability. If it is, but the system is not performing in an optimal way then you can handle this through other ITIL® disciplines such as Incident, Problem and Capacity Management.

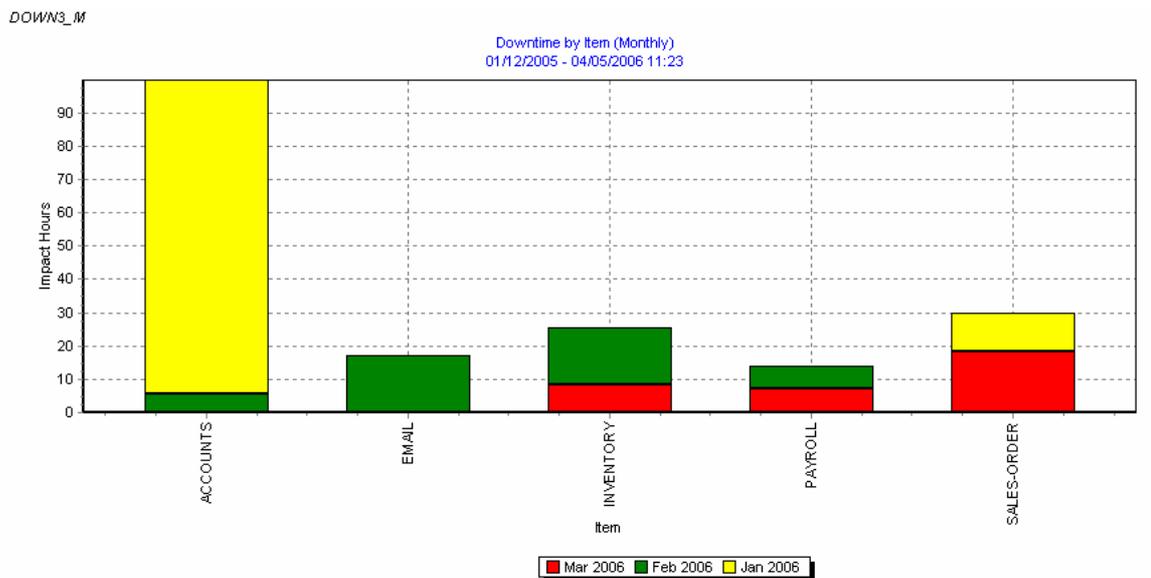
## Appendix A – Sample Graphs

Both of these types of graphs and more are can be produced automatically by Serio IT Service View Pro.

Sample 6-month Availability Graph for Key Services. Produced directly from Serio. This graph uses the Availability Formula previously described. We can immediately see that our Accounts service had terrible Availability during January.



Sample Monthly Graph of Unavailability (downtime) for Key Services produced directly from Serio.



### Sample Weekly Graph of Unavailability (downtime) for Key Services produced directly from Serio.

DOWN3\_W

