Medway Grid for Learning

Policies and Guidance

Technology Guidance

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Introduction

This document is intended to provide general information and guidance related to connecting school LANs to the broadband Grid for Learning network, and running school systems and servers effectively to deliver a reliable, high performance service. It also provides specific policies adherence to which is necessary for the smooth and effective running of the whole network.

1 Technology Guidance

1.1 Local Area Network Switches

Ethernet Switching (technically called layer 2 switching) is the de facto standard for Local Area Network Infrastructure. It is recommended that all new LAN installations use switching as a standard, in particular the Cisco Catalyst 3500XL series of switches are the current standard for broadband connectivity. These switches offer superior throughput, functionality and future proofing. Gigabit interface modules are available for these switches if required.

There is an emerging technology known as “layer 3 switching” but this is not recommended for use in schools at present.

1.2 Local proxy servers

The use of local proxy servers in schools in generally not required to improve performance as the existing circuit capacity generally gives adequate response times, however it is anticipated that this

may be useful in the future to delay a requirement for circuit upgrades. All web traffic is cached centrally to improve the response from slow sites, and to make best use of the Internet connection. The use of local proxy servers is not recommended, however if a school does wish to install such a device it is important to note that it must not be of the traditional type which presents only one IP address to the outside world. This will prevent any differentiation in web filtering from being applied to the school, thus preventing the development of many useful services in the future. Also proxy servers are not security devices although it is sometimes suggested that they improve security, proxy servers are only designed to improve web performance and manage Internet connectivity. If you feel you require firewall services please see the section on local firewalls.

1.3 Local firewalls

The use of local firewalls is not generally required in schools, and has many associated problems. There is a firewall service between the broadband network and the Internet. A statement of the policy regarding protocols and port numbers which may be used over the Internet connection is included at the end of the web filtering policy. This security provision is dedicated to Medway schools and is separate from other Medway Council corporate arrangements or other public access / adult educations sites run by the Council.

There are three main types of firewall, packet filtering, proxy, and stateful inspection.

- Packet filtering firewalls are the simplest and least effective, and operate in a similar way to some router configurations, allowing or denying traffic based on source and destination address and protocol type.

- Proxy firewalls are generally older designs and provide very good security but at the expense of either performance or onerous hardware requirements. There is also the limitation that some network protocols cannot be handled by a proxy service and this effectively denies the use of these services behind the firewall.

- Stateful inspection firewalls appear operate similarly to packet filtering firewalls but inspect the condition of the connections passing through them to offer greatly improved security. In general it is recommended that all new firewalls are of this type.

Due to the difficulties introduced by local firewalls there is no support for connection issues that schools may have with machines connected behind such a device.

1.4 Video Conferencing

Video conferencing is currently under trial with two sites, more information will be posted here when the results are available.

1.5 Remote Access for Support

Secure remote access is currently available to all bona fide support and maintenance organisations. Organisations currently using this service include RM, EIS, Pronet, Capita, and Insen. If your support organisation is not listed here and you would like them to be able to remotely access your systems for support or maintenance purposes please email noc@medway.gov.uk with a brief description of your situation and a contact at your chosen organisation.

1.6 Streaming Media

Currently streaming media services are not available over the broadband service. This is because of bandwidth limitations which mean that it would be impossible to delivery a suitable quality of service without a streaming media cache. There is a proposal believed to be in development by at least one school to make a case for purchasing a streaming media cache server and enabling the use of streaming media across the entire network.

1.7 RM School Share

1.8 Time Services

Atomic clock synchronised time service are available from the server time.medway.org.uk – this server supports NTP, SNTP and Unix style time services. Estimated clock accuracy is ±20ms from GMT. Maximum jitter is therefore 40ms, not taking into account the effect of network traffic on your local LAN or broadband circuit.

1.9 Auto-uploading local ftp servers

Some sites wish to work on a local intranet server for development purposes and then have this local copy moved to their external web-site or centrally hosted intranet site overnight. This can be accomplished by using command line WS-FTP, scheduled with any commonly available scheduling software.

1.10 Video on demand / Multicast technology

This emerging technology delivers streaming video and audio to multiple computers with only one data stream passing through the network. There are relatively complex considerations involved and technology is not well established. The current recommendation is to invest in new standards based feature rich hardware as described in section 1.1, which is most likely to support future multicast technology.

1.11 Available web-site server-side technology

A variety of active technologies now exist to support more advanced and interactive web-site design. There is a limit to the range of such technologies which can be accommodated on the existing servers and the following items clarify the status of each main technology. Should more flexibility be required there is a server co-location proposal at the end of this section.

1.11.1 CGI scripting

CGI scrips are not currently available, but it is likely that a few standard scripts will be made available in the future.

1.11.2 Server Side Includes (SSIs)

SSIs are not currently available.

1.11.3 Active Server Pages (ASPs)

Active Server Page technology is currently available on all school intranet and Internet sites.

1.11.4 Back-end database services connection for ASP

No back-end database services are available (e.g. SQL / Postgress / Oracle), however users requiring this kind of functionality can access an MS-Access format database file on the servers from their ASP scripts.

1.11.5 PHP services

PHP services are not available on either the internal or external web-sites. A server co-location service is available for schools wishing to run a PHP server on the Internet. A copy of this proposal can be obtained by emailing noc@medway.gov.uk

1.11.6 Server co-location proposal

We now offer the additional service of co-location facilities for school owned and managed servers. The Medway Council Co-location Hosting Service provides a location to install your own Internet server and a high-speed Internet connection into the Medway Council backbone. An outstanding advantage of the Co-Locate service is the direct connection to the Medway Council network. The server is purchased and owned by the school and is of a predetermined specification which is suitable not only for this service, but also future school hosting centres.

1.11.6.1 Benefits

Security

All Co-location hosting services are housed in a secure facility with environmental air conditioning and backup power. Entry is only by pre-authorised personnel.

Flexibility

Medway Council Co-location hosting service comes with rack-space to accommodate all servers purchased. The Co-location facility is currently housed in the Compass Centre, Chatham Maritime.

Performance

Full unrestricted line speed will be available from school premises to the server.

Reliability

All servers are connected via a dedicated connection at 10 or 100Mbps to the Medway Council redundant backbone. Medway Council uses an ATM Switched network to ensure maximum uptime and efficiency for customers. Medway Council monitors the network 24x7 to ensure network availability. The Co-Location hosting service provides a continuous 24 hour power supply at 220 VAC, 50 Hz. This electricity supply is backed up by an Uninterrupted Power Supply (UPS).

Manageability

Customers have 8x5 access to their servers for maintenance and Medway Council can provide 1st Level Technical Assistance for power cycles, CD changing and other similar tasks. Medway Council will register domain names for customers and provide Primary and Secondary Domain Name Service (DNS).

1.11.6.2 Features

- Complete customer control of servers
- 8x5 physical access to servers
- Located in a secure, facilities managed, data-centre
- Totally private network configuration
- Guaranteed bandwidth levels
- Fixed price bandwidth

1.11.6.3 Pricing

One-off server purchase

Price excl.VAT :	£2,875.83
Price incl.VAT :	£3,379.10

Management

Annual change excl.VAT:	£1000
Annual change incl.VAT:	£1175