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Feature

Windows 2000 QoS Admission Control   ▲ to top

When we talk about Windows 2000 TCP/IP we usually focus on the bread and butter stuff like WINS, DNS, DHCP, and maybe a little RRAS and RADIUS. But the Windows 2000 TCP/IP stack runs deep. If you dig just a little bit you'll find some really cool additions.

One important new component in Windows 2000 is Quality of Service (QoS) Admission Control, which is founded on the IETF standard for

subnet bandwidth management (SBM). QoS Admission Control enables network administrators to guarantee bandwidth to a client for an application. The primary uses for QoS are currently audio and video applications, which often need to reserve bandwidth to ensure acceptable performance.

Without some control of what network traffic receives priority on the network, a spike in network traffic due to data transfers may interrupt audio or video feeds. As real-time applications become more common on IP networks, services such as QoS will become standard parts of the network infrastructure in order to provide acceptable performance for all uses of the network.

QoS Model

QoS is implemented by clients requesting a bandwidth reservation from an Admission Control Service (ACS) host. The ACS host is configured with a maximum amount of bandwidth that it can reserve for clients, and approves or denies client requests depending on the bandwidth available for reservation. These requests and replies are communicated with the Resource Reservation protocol (RSVP).

RSVP is also used to distribute the reservation request to all hosts in the path of the traffic flow, and maintains the reservation at each network host. Routers and switches that don't support RSVP simply pass the RSVP traffic along, and if such devices are present in the traffic flow then there is no guarantee that the QoS reservation will be enforced end to end. Network interface cards must comply with the IEEE 802.1p standard to support QoS; devices not meeting this specification will not be aware of QoS reservations and thus may compromise the integrity of the reservation by using so much bandwidth that there is not enough left to fulfill the reservation.

An RSVP reservation is started by a server, which sends a PATH message to the ACS host. If the request is approved, the ACS host forwards the request to the client, which also establishes the PATH state at each hop, or router, along the path. The client creates a RESV message and sends it to the server along the route as determined by the PATH message it received. Each router receives the RESV message, approves or denies the request, and informs the client that data is to be sent. The client and server send PATH and RESV messages along the route during the session to maintain the reservation.

QoS Windows Components

A QoS implementation on a Windows 2000 network is composed of protocols and services working together to request a bandwidth reservation, approve or deny a request for bandwidth, control the traffic, and maintain the reservation until it is no longer needed. The required Windows components are the QoS Admission Control service running on a server, and the Packet Scheduler service on each Windows 2000 and Windows 98 client that will run applications requiring QoS.

The QoS Admission Control service must be installed on a domain controller in each subnet on which you want to provide QoS services. If you have a physical network that includes more than one subnet, you must install QoS Admission Control on a separate domain controller for

each subnet. The QoS Admission Control service provides ACS host services, and can service QoS operation from other operating systems that support SBM.

The QoS Admission Control service is a network service in Windows 2000. In Windows NT 4.0, network services were installed on a tab in the Network Properties dialog. In Windows 2000, however, network server services are installed from Control Panel's Add/Remove Programs application by clicking on the Add/Remove Windows Components button. This will invoke the Windows Components Wizard, which will allow you to install or uninstall network services such as QoS Admission Control, IIS, Indexing Service, and Message Queuing. The Packet Scheduler is a network client service, and is installed in the network adapter properties dialog.

The QoS Packet Scheduler is composed of two components. The packet classifier, as its name implies, classifies packets that are then queued to be processed by the packet scheduler. The packet scheduler decides the delivery schedule for each packet queue, creates queues for each particular data flow, and services the queues according to the RSVP reservations in effect.

QoS Admission Control Policies

Control policies for QoS are stored in Active Directory, and managed with the QoS Admission Control console. Policies are defined according to both authenticated and unauthenticated users. Unauthenticated users are users who are not logged on to domain accounts. Policies are configured in the enterprise container for these two types of users, and additional exceptions can be made when the enterprise policies are not adequate.

Policies can be defined by the following classes:

- user policy in a subnet
- group policy in a subnet
- authenticated user on a subnet
- unauthenticated user in a subnet
- user in the enterprise container
- authenticated user in the enterprise container

Policies are applied in a specific order, and policy values with a higher priority will always override values with lower priority. If values are not configured at the higher priority, QoS will use the lower priority policy and accumulate values as continues down the order.

Subnet objects are configured in the QoS Admission Control console, enabling you to define policies that will affect all QoS Admission Control hosts in the subnet. A subnet object also allows you to define user policies on the subnet level.

QoS is well known for router administrators but it something the Windows 2000 admin doesn't deal with much. But if you're finding that your voice/video traffic is suffering under the strain of network application traffic, you might find that the Windows 2000 QoS is just what the doctor ordered.

This week's feature article by
Thomas W. Shinder,
M.D., MCSE

Ask Uncle Bill

Q and A's

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Question:

Hi, Uncle Bill.
Got an issue with the ISA console - trying to run it on my Win2K Pro machine. It installs fine but when I try to connect to the server I get "Operation Failed - You do not have necessary permissions to perform this act. Failed to Connect". Now I've logged on to my PC as the network administrator and can conenct without a problem through the console. I've even made myself a member of the exact same groups as the Administrator account (specifically Administrators, Domain Admins, etc) to no avail. Anyone else seen this? Thanks.
--Scott

Uncle Bill says:

Hiya Scott! You've become the victim of the ISA Management console DCOM from hell error. No problem! A lot of people have that one. **Run on over here** and the step-by-step is there for your remote ISA Management console enjoyment.

Question:

Hi, Uncle Bill
When I was allocating some IP address to one of our office machines I received the IP conflict error. I have open the Event Viewer and found the following error message: "The system detected an address conflict for IP address 203.199.178.194 with the system having network address 00:50:BA:32:31:D1. The local interface has been disabled". Now I want to know from which machine I was receiving the above error. I can find the MAC Address in Event Viewer. How to find now IP Address of the machine which is getting conflict. I have typed the command "arp -a" but I could not find the answer. Is there any tool to find the IP Address if we know MAC Address of the machine. I would be appreciate if any one could help me for this.
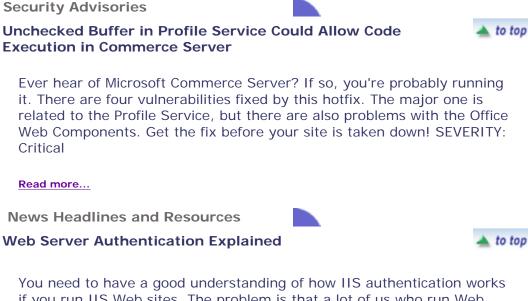--Ramprasady

Uncle Bill says:

Hey Ramprasady! Having a hard time finding the culprit, eh? You could call every desk in the company and ask if they saw that same error. Of course, you'll probably find that the owner of the computer with the conflicting IP address is on a six month vacation. There's got to be a better way! How many clients do you have on your network segment? You could ping each one of them manually, but that wouldn't be any fun. Use a tool like the **LANguard Network Security scanner**. It's free, and makes it easy to scan your network. After scanning your network, save the report. Use the search feature in your browser to find the MAC address of the offender. You'll find out a lot of other interesting information about the offender too!

Don't Be Shy!

Got a question about MCSE certification or an event log error that just won't go away? Send it in! We'll be answering a question or two every week. Send your submissions to Uncle Bill **here**.

Security Advisories

Unchecked Buffer in Profile Service Could Allow Code Execution in Commerce Server

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Ever hear of Microsoft Commerce Server? If so, you're probably running it. There are four vulnerabilities fixed by this hotfix. The major one is related to the Profile Service, but there are also problems with the Office Web Components. Get the fix before your site is taken down! SEVERITY: Critical

Read more...

News Headlines and Resources

Web Server Authentication Explained

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You need to have a good understanding of how IIS authentication works if you run IIS Web sites. The problem is that a lot of us who run Web sites on IIS don't really have a clear understanding of the details. Ronald Beekelaar takes the seventh veil off IIS authentication and makes it all clear.

Read more...

Windows 2000 Getting the Heave-Ho in 9 Months

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Windows 2000 we hardly knew you! What? You haven't even begun your Windows 2000 roll-out? Microsoft has decided OEMs will not be able to include Windows 2000 Professional on new systems starting in April 2003. This could have a profound impact on your upgrade strategies, as the dreaded license 6.0 takes effect.

Read more...

Microsoft Optical Mouse is Whack

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I thought about getting a snazzy Microsoft optical mouse for my main workstation. I decided not to because the Microsoft Trackball Mouse has been working fine for four years, so why prematurely retire it? Good thing I didn't get a new mouse because it looks like there's something wrong with the Microsoft optical mouse. Check out the link and get your proof of purchase ready.

Read more...

Get a Microsoft "Dream Machine"

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Microsoft is getting into the PC market? Could be. They're partnering up with FIC and they're not even using an Intel chip for the main processor!

It's questionable whose dream this machine is based on, because it looks like a real low-end slow poke.

Read more...

Recovering EFS Encrypted Data

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So your users have learned about how to encrypt everything on their hard disks. Hey, that's good security policy, right? Then you get the call: "I can't open my encrypted file, will you open it for me?" Ahem. Check out this article for some hints on a way out.

Read more...

Backing Up and Restoring IIS Servers

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The last couple of weeks we went over how to back up and restore a Windows 2000 Server computer. One thing noted was you need to take special considerations for particular services. IIS is one of those services. Check out this article for a good outline of what you need to restore your IIS setup.

Read more...

Security Fix Blocks VPN Connections

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Did you happen to notice after you installed security fix MS02-029 that your users couldn't log onto the VPN anymore? If so, you're not alone. There was a problem with the patch that prevented everyone but administrators from logging in. Check the link for details.

Read more...

Cool GUI Interface for the Windows XP NetMon Capture Utility

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Did you know Windows XP comes with a command line network monitor tool that allows you to make .cap files you can read in your full fledged Network Monitor? Its part of the Windows XP support tools. This article shows you how to use this command line tool together with a cool script that makes it easy to configure. Definitely worth a look!

Read more...

SMTP Mail Relay Scenario using ISA Server and Mail Essentials 6.0

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You must get a handle on spam. I don't care if the EU decided to make a law against it. Making more laws rarely solves a problem, but technology does! Check out this article on one method you can use to block spam from attacking your Exchange Servers.

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Download of the Week

MDaemon 6.0.0

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Need an excellent email server that doesn't cost you an arm and a leg for a small or medium sized business? Then try out MDaemon 6.0.0. You

get shared Calendaring and scheduling, public folder user flags, IMAP folder sharing, instant messaging, spam blocking, virus checking, a cool HTML client and more! Try out an eval version for 30 days. If you don't need a MAPI client support, then it doesn't get much better than this.

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