

[mikrotikconsulting.com](http://mikrotikconsulting.com)  
Dennis Burgess

## Using MikroTik in the Small to Medium Enterprise

**mum**

May 31 - June 1st  
ORLANDO, USA



# Dennis Burgess

- Network Consultant for over 8 years
  - Microsoft / Cisco
  - Small / Medium Enterprises
  - VPN, Site-to-Site Connectivity
- Operate 2K Wireless WISP
  - Past 3 years
- Network Engineer for Several in the US
- Consulting with WISP and other MikroTik Consultants both in the US and Several Other Countries



# Items to Cover

- Wanted to Break away from the Wireless Only Issues.
- This is not a technical presentation / about the ability to sell MikroTik Features to Business Customers
- What is a Small / Medium Business?
- What are the Small / Medium Business Needs
- What other products are available.
- Why choose Mikrotik for these customers
- Case Study of a Medium Enterprise with over 200 Users

# Small Business Needs

- DEFINE
  - Under 30 Users
  - Usually a single Server, Small Business Server.
  - Might host their own E-Mail or Applications
- Needs of a Small Business
  - VPN (Virtual Private Networking)
    - Internal Security Cameras
    - Remote Connectivity to Office Applications
      - QuickBooks, E-Mail, Inventory Programs
  - Bandwidth Controls?
    - Who is downloading what!
    - Bandwidth is at a premium sometimes!
  - Ex Of Customer with only 384k
    - Had DSL 128k/384k
    - Constant Issues with using their Internet Services



# Medium Business Needs

- Define:
  - 30-250 users
  - Multiple Servers
  - Several Locations
- Needs of the Medium Business
  - VPN
    - Remote access to internal applications
      - Outlook, E-Mail, Files, Applications! Servers.
  - Firewall
    - Might need multiple public IPs
    - Might need Multiple publics going to several servers

# Med Business cont

- Site to Site Connectivity
  - L2TP, PPTP, IPSEC, IPIP, EoIP
  - Wireless Connectivity to other buildings, and/or warehouse.
  - VoIP Between offices
    - Packet Prioritization – Bandwidth Shaping
  - Routing across private line connections
    - T1s, Frame Relay Services
    - Multiple Connections/Routing and Failover
  - Bandwidth Controls
    - Control/Prevent P2P Traffic
    - Internal Application and traffic shaping

# Med Business cont.

- **POLICY ENFORCEMENT**
  - Force users to use Proxy Servers
    - Anti-Virus Proxy Servers
    - Caching Proxy Servers
    - Internal Firewalls – Across Subnets
- **TOOLS**
  - Troubleshooting tools
    - Torch
    - Packet Sniffer, with streaming
    - Queues and packet shaping!



# Other Residential Focused Routers

- Linksys Routers
  - Small Home/Business
  - Single IP WAN Support
  - Little Firewall Ability, virtually no bandwidth controls.
  - Some have VoIP Features
    - Ex, Vonage VoIP Router/ATA
  - Ultra Low Cost = Low Features
  - Lower Speed Routing (under 20meg)





## Other Residential Focused Routers

- Netgear
  - Limited IP Support
  - Limited Firewall support
  - Limited Bandwidth controls
  - Geared towards home users
  - Low Cost, Low Features



# Other Business Grade Routers

- Sonic Wall
  - Decent Support
  - Easy IPSEC configurations
  - Multi-Site Connectivity
  - Quick and Easy Firewall abilities
  - Limited bandwidth controls
  - Licensed based on the number of remote connections and users in some cases
  - Pricing Starts after a few hundred Dollars and goes up according to licensing needs.



# Other Business Grade Routers

- CISCO
  - Great Firewall Support
  - Great Support and Support resources
  - Packet marking/shaping requires higher end gear, that gets costly.
  - Even Low end gear has a high price tag
  - ITS CISCO.. That's why you buy it!

# So How does MikroTik Compare with these?

- Great Firewall Support
  - Firewall across ports as needed, subnets or interfaces
- Bandwidth / Packet Shaping
  - HUGE Advantage – Limitless Configuration Options
- VPN Server, VPN Client
  - No Additional Licensing needed. Hundreds of connections possible.
- Multi Site-to-Site Connectivity
  - Not only single connections, but connections inside connections along with High number of potential constant connections.
- No extra licensing for additional clients or sites
- Network tools are built in
- Graphing and network usage, built in
- Extensive Routing Support including routing protocols
- Routing rules
  - Very important in some cases

# Comparing MikroTik

- Scripting Support
  - Allows for e-mailing of backup files
  - Many other types of features can be programmed in. Including failover, etc.
- Radius Support
- VLAN Support
  - Great for multi-tenant buildings etc
- Bridging
  - Still can control bandwidth and network usage, very good for in-place networks
- Wireless Access Points and Clients
  - NStream protocol great for point to point links!
  - WDS / Mesh supported

# ON TOP OF ALL THAT

- **COST!**
  - Small / Medium Business's don't want to spend cash if they don't have too.
    - \$250 for a 532 with License and Case
    - Add configuration time.
- **CALEA CAPABLE!!!**
  - Companies supplying open WiFi need to be CALEA Compliant



# Pricing

- Linksys - \$30 to \$250
- Netgear - \$40 to \$99
- SonicWall - \$399 to \$2000
- Cisco - \$800 to ??????
- Mikrotik - \$250 - \$600

# Profitability

- All of your configuration time can be hourly charged.
  - Provide Managed Firewall for your existing Wireless/Wired Customer base – Per Month Charge
  - VPN Server – Managed – Per Month Charge
  - Unit that can grow with Company to multiple sites.
  - Extremely Reliable
  - Dynamic Routing Protocols make larger networks easier to configure than ever
  - Routing Rules and Scripting provides Limitless configurations
  - Tools are a must if you have people downloading from the internet.
  - Multi-levels of Router Board hardware to accomplish any task
    - If needed, can go to a x86 platform and



# Case Study

- Existing Client
  - 7 Locations Across Mid-West
  - 1 Location in USVI
    - Connectivity
      - Internet T1s at all locations
      - Cable/Wireless Connections at all locations
        - » Most with DYNAMIC IPs
    - Multiple IP Blocks at Main Office
    - 15+ Servers
      - Public Web Servers
      - Public Mail Servers
      - Web Applications, SQL databases
    - Proxy Server
      - Anti-Virus/Spy-ware

# Equipment Used

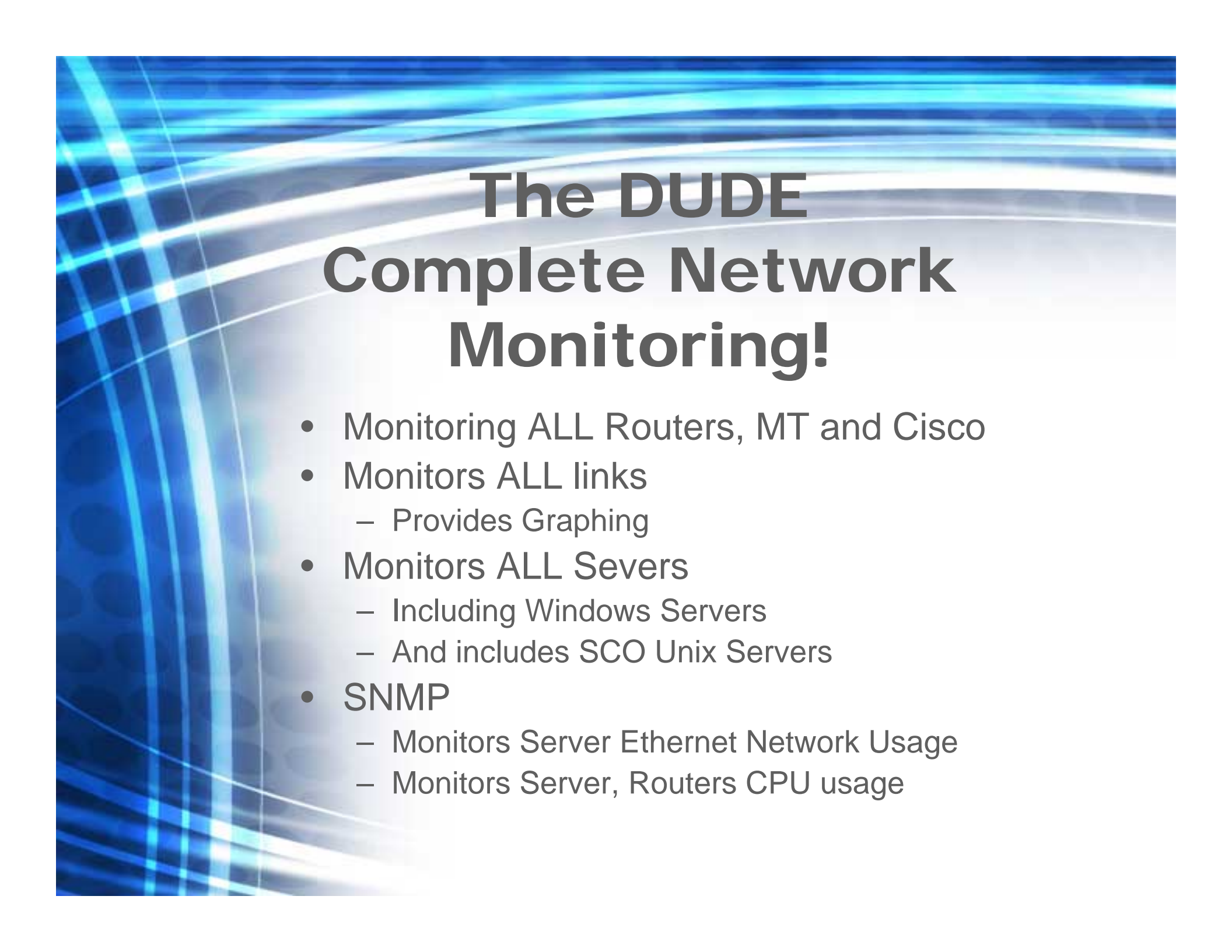
- Central Location
  - 1 gig Mikrotik RouterOS
    - 6 Ethernets, 128meg RAM
    - Managed Cisco for Bonded T1s
    - Cable Modem
- Remote Locations
  - Router board 532
    - 3 Ethernets, 32meg RAM
    - Cisco 1700 Series with T1 WICs - Existing
    - Cable Modems/Wireless Connections (Ethernet)

# Case Study - Issue

- Main DMS (Dealer Management System) is a SCO Open Server
  - Application uses client software to TELNET into single server
  - Requires prioritization of all traffic to/from this server
    - Without this, a single download at a remote location could cause the application to LAG, you hit the G key, it takes 3-5 seconds for the G to display!

# Case Study - Issue

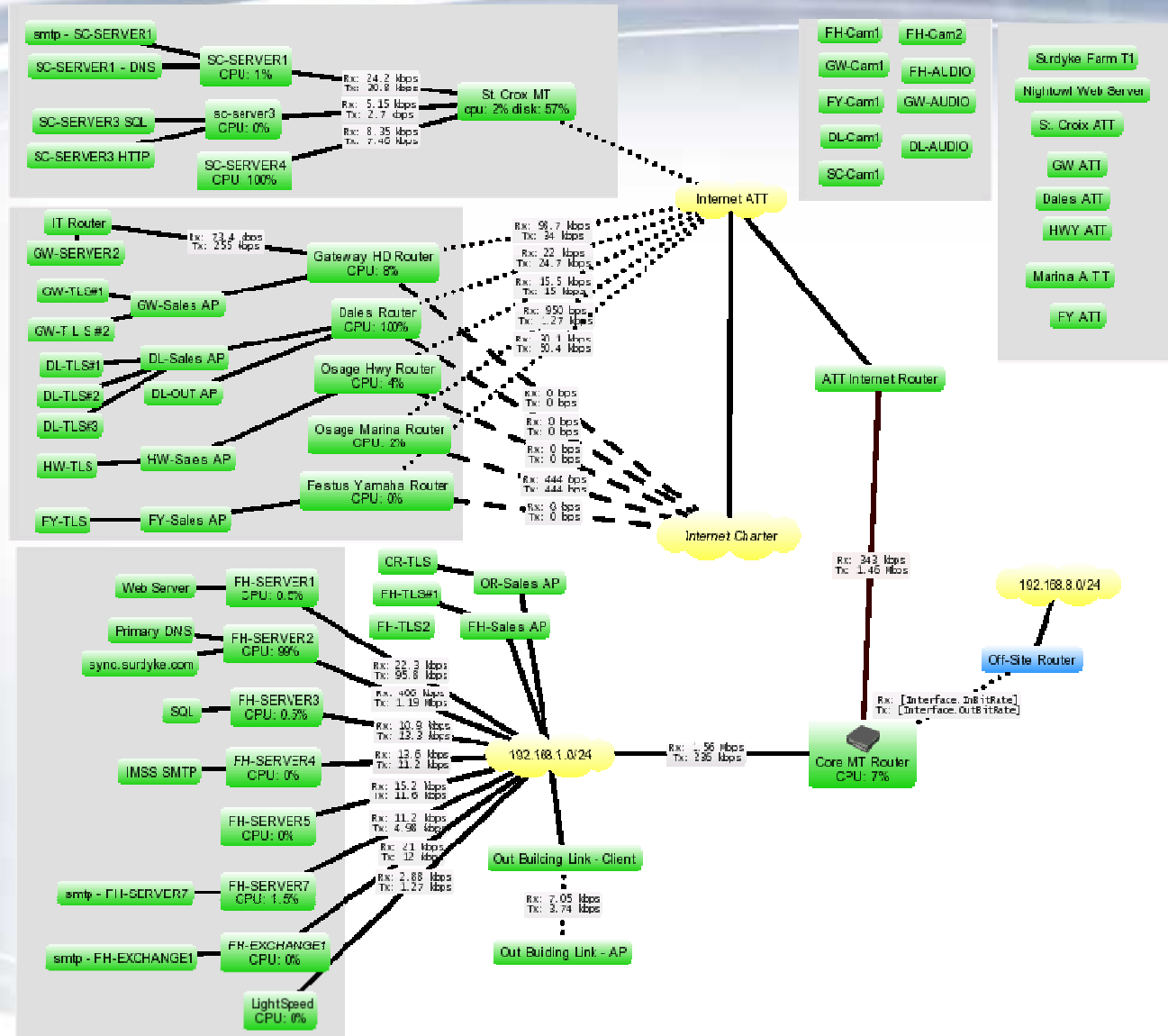
- All sites have multiple connections
  - Multiple Connections with multiple public IPs on each 532
  - All traffic, including internet should go to MAIN site. Proxy server is REQUIRED.
  - Main site requires to bring in multiple connections from multiple sites, and fail over if needed.
  - Main site also required to run public services for E-Commerce System, public Web and Mail Servers



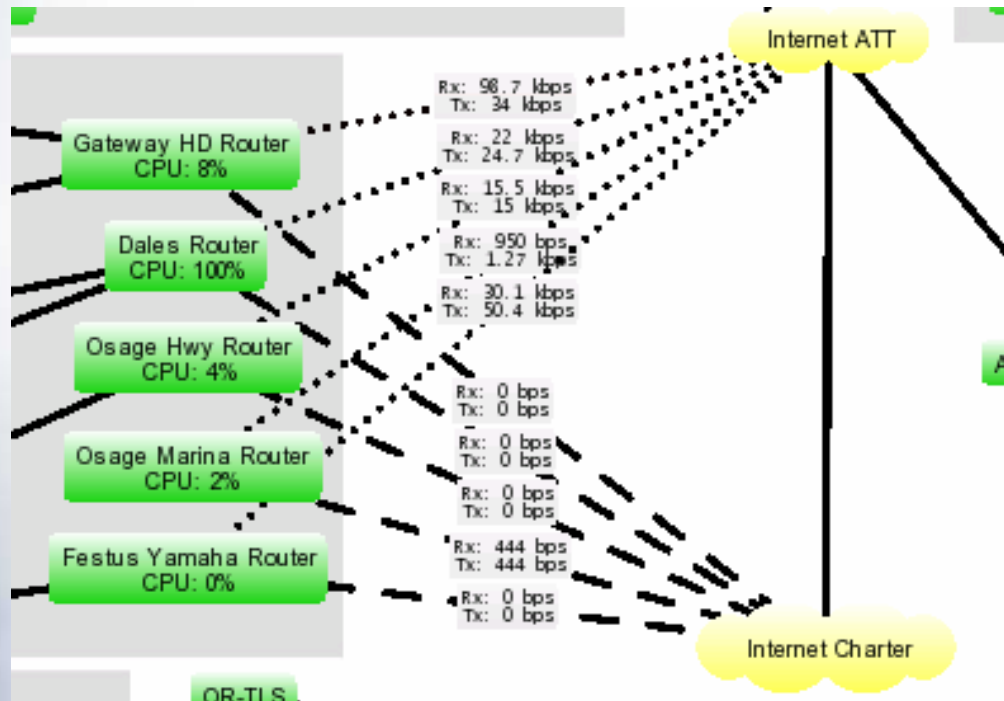
# The DUDE Complete Network Monitoring!

- Monitoring ALL Routers, MT and Cisco
- Monitors ALL links
  - Provides Graphing
- Monitors ALL Servers
  - Including Windows Servers
  - And includes SCO Unix Servers
- SNMP
  - Monitors Server Ethernet Network Usage
  - Monitors Server, Routers CPU usage

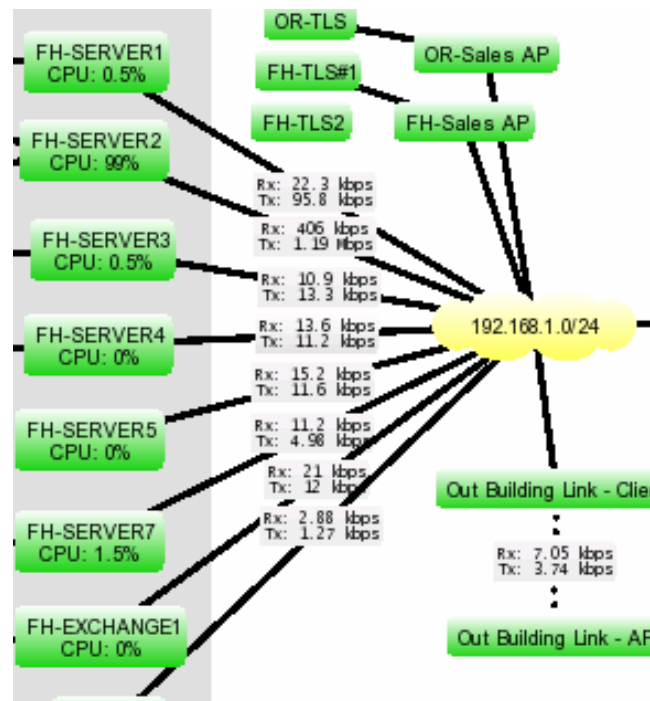
# MONITORING



# MONITORING Remote Site Connections



# MONITORING Servers





# Fail Over & Bandwidth Management

- Usually less than 30ms FAILOVER to backup Connection
- TELNET Application typically does not LOOSE connection.
- Other than a overall Speed decrease from 1.544meg to 384k/768k, users notice no difference
- Once failover occurs, e-mails to admins go out showing that the router had started to use secondary route.

The background of the slide features a series of dynamic, glowing blue and white light trails that curve across the frame, creating a sense of motion and technology. The trails are most prominent on the left side and fade towards the right.

## Conclusions on this Case Study

Mikrotik Provided the site to site connectivity, bandwidth management, packet prioritization, and firewall rules necessary for this company to keep their main application working without LAG, while giving them the maximum bandwidth available to other applications and web usage.



# Conclusions on this Case Study

Mikrotik Router OS Per site cost was about \$250 per remote site and less than \$600 for the main site. That's a whole network for less than \$2500!

Cisco routers to do the Site to Site connectivity was quoted for around \$2900 per SITE from another company. They did not offer the auto-failover, as they required BGP connections.



# The End Story

- Mikrotik is a viable solution for the Small and Medium Size Enterprise
- ISPs of all types can profit from extra services at each customer.
- MikroTik also provides cost saving solution to most Enterprises networking needs.
- MikroTik also provides more features per dollar than other routers in its class.



# Thank you!

Presentation By:  
Dennis Burgess

[www.mikrotikconsultant.com](http://www.mikrotikconsultant.com)

Mikrotik, Cisco, Microsoft Certified  
Consultant

